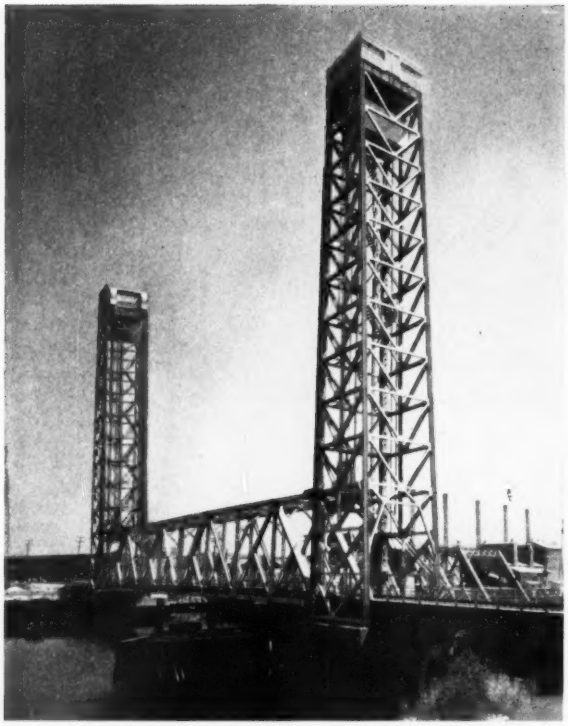
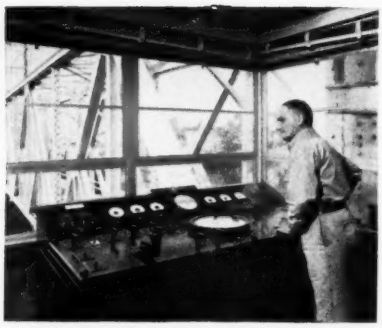
CONSTRUCTION
METHODS AND EQUIPMENT

November 1952

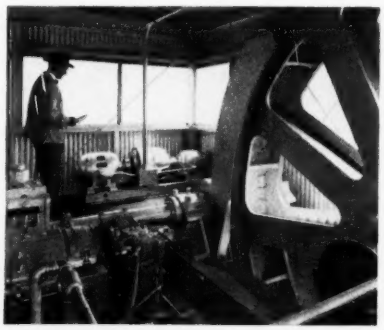
A McGRAW-HILL PUBLICATION



AMPLIDYNE CONTROL—first applied to movable bridges by G.E.—permits raising and lowering Oakland's new Fruitvale bridge in a shorter time than by any other method. Amplidyne control responds instantly, provides faster acceleration and deceleration.



BRIDGE OPERATION is centered in operator's console. Amplidyne's closer control keeps ends of span aligned during operation, "seats" bridge accurately and smoothly.



REDUCED STRESS ON BRIDGE structure and machinery results from torque limiting, inherent in amplidyne control. Photo shows part of G-E drive equipment in east tower.

Smooth, pinpoint control speeds bridge operation

G-E amplidyne-controlled drive prevents skewing, seats span faster, protects structure from shocks

Key to precise control, faster operation, and better equipment protection of Oakland's new Fruitvale Avenue Lift Bridge is its General Electric amplidyne-controlled drive system. Working closely with Woodruff & Sampson, consulting engineers for the Corps of Engineers, Judson Pacific–Murphy Corp., general contractors, and Enterprise Electric Works, electrical contractors, G.E. has again engineered the versatile amplidyne into an outstanding movable-bridge system.

This is but one example of the help G-E engineers can provide *your* engineers or consultants on installed equipment for heavy construction projects. Contact your G-E Apparatus Sales Office. General Electric Company, Schenectady 5, N. Y. 664-23

WORLD'S FIRST amplidyne-controlled lift bridge—pioneered by G.E.—is Strickel Memorial Bridge in New Jersey. Consulting engineers were Hardesty & Hanover.

Engineered Electrical Systems For Heavy Construction

GENERAL ELECTRIC

B.F.Goodrich

Partner C. A. Schwope and Gen. Supt. O. D. Pierce of Schwope Bros. examine a BFG tire.

Tires can be recapped 2 and 3 times—save contractor 30% on tire costs!

MORE than 70 trucks, tractors, shovels, scrapers and other units are used for earth moving and construction work by Schwope Brothers, San Antonio, Texas. The picture shows one of the company's machines at work on the San Jacinto Dam project, where a wilderness is being converted into a five to six thousand foot reservoir to serve Houston's water needs.

You'd expect rugged operations like this to shorten tire life greatly. Yet the B. F. Goodrich Universal tires above have rolled three years without ever being off the rim! And Schwope Bros. gets similar service from all its BFG tires: over 65,000 miles—and still going strong—on units hauling heavy construction equipment; more than 8,000 hours on off-the-road machinery.

Even after service like this the company is still able to recap BFG tires two and three times for a 30% saving on tire costs. No wonder Schwope Bros. uses B. F. Goodrich tires exclusively and Partner C. A. Schwope says they "often represent the difference between profit and loss".

The patented nylon shock shield is the reason why BFG tires cut costs. Layers of strong, elastic nylon cords stretch together under impact to protect the tire body from smashing shocks and bruises. This nylon shock shield saves you money 4 ways:

(1) more recappable tires and more hours of service per recap (2) increased original hours of service (3) greater bruise resistance (4) less danger of tread separation. The exclusive shock shield—which costs you nothing extra—is built into all tires of 8 or more plies. *Double* shield in larger sizes.

B. F. Goodrich makes a complete line of money-saving off-the-road tires. See them at your BFG retailer's store. You'll find the address under Tires in the Yellow Pages of your phone book. *The B. F. Goodrich Company, Akron, O.*

RESEARCH KEEPS
B.F.Goodrich
FIRST IN RUBBER

Constant Pounding Causes this—

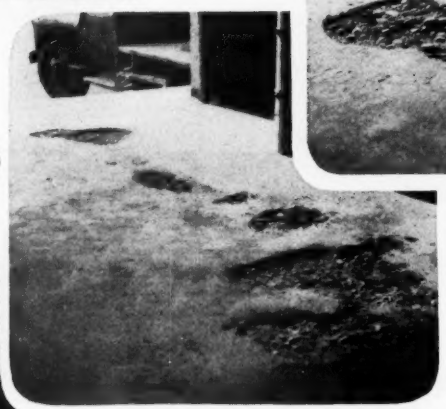
How THORITE Patching Mortar, repaired and added strength to loading platform in 30 minutes

A QUICK PATCH for concrete walls and floors

BEFORE

Largest area is 2′ long and 18″ wide, 1½″ deep.

Smaller areas, around large one, is in complete state of disintegration.



AFTER

Thorite Patching Mortar has been brushed and troweled into patch and leveled, even with surrounding surfaces.

Floor area was back in use, for heavy warehouse trucks, 30 minutes after beginning work.

Get our 20-page brochure pictorially describing in detail "HOW TO DO IT". It's yours for the asking!

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NEW EAGLE, PENNSYLVANIA
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1023

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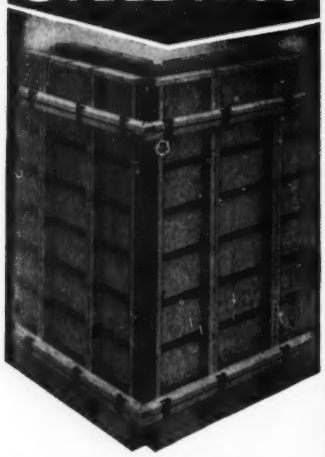
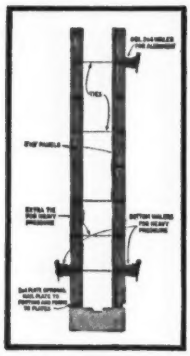


for HIGH WALLS —FAST POURS

Symons heavy duty Steel Rib forms assemble and strip quickly and easily saving you time and labor costs. Because stripping is simple, and the steel rib reinforces the vital parts, Symons Forms last from 50 to 100 uses . . . this means cost per use is exceptionally low.



Try these forms on a rental basis. Rental charges apply on the purchase price.

To get a comprehensive picture of how Symons forming system works and its cost to you, send in the plans for your next job. We will study your needs and send you a form layout and job cost sheet—no obligation.

Symons

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Kindly send information regarding Symons Steel Rib Forms.

Name_____

Address_____

City_____ Zone____ State_____

CONSTRUCTION METHODS AND EQUIPMENT

Volume 34, Number 11 **NOVEMBER 1952** Established 1919

Pay Dirt in This Issue

Alcan Construction Battles Difficult Access 42
Despite harsh terrain and snow slides, power project is carved out by tractors, served by helicopters and tramway.

Novel Rigging Swings Long Piles Plumb 52
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Motorized Buggies Work in Shallow Crawl Space 58
Powered units make easy work of handling 3,000 yd of earth and rock mined underneath terrace slab of concrete.

Water Casing Jacked Under 14 Sets of Tracks 92
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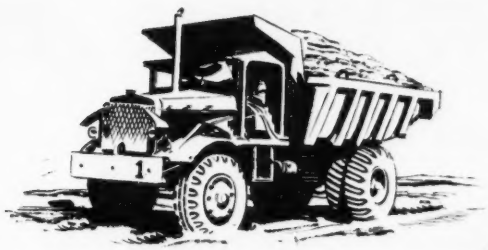
MUSCLE MAN
for tire-killing jobs



THIS burly giant pulls through rough going that other tires find hard to take. Massive lug-bars armor its underbody and sidewalls—shrug off stones, stumps, snags and potholes. Extra thick, self-cleaning treads shield its extra thick plies—give you better traction, *full pull*, forward or reverse. A sturdy standby is this super-tough Goodyear—the Hard Rock Lug. Wherever the going is really rugged, it can save you time and money—perhaps the job itself!

HARD ROCK LUG
Super-tough champ in all types of tire-killing work.

HARD ROCK RIB
Companion tire for front wheels in all tire-killing service. Easier steering, smooth rolling, same cord body, same shoulder and sidewall as the Hard Rock Lug.

ROAD LUG
This high-stamina, dual-purpose tire is best for trucks that operate both OFF and ON the road. Tough construction and special tread design provide super-traction off the road—long, smooth mileage on the road.

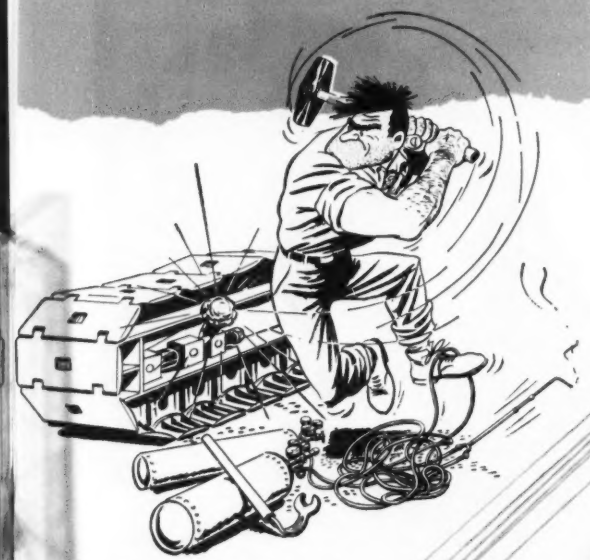
FOR EVERY JOB, THERE'S A COST-CUTTING GOODYEAR TIRE!

Road Lug—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

HOW TOUGH DO YOU



the Hard Way?

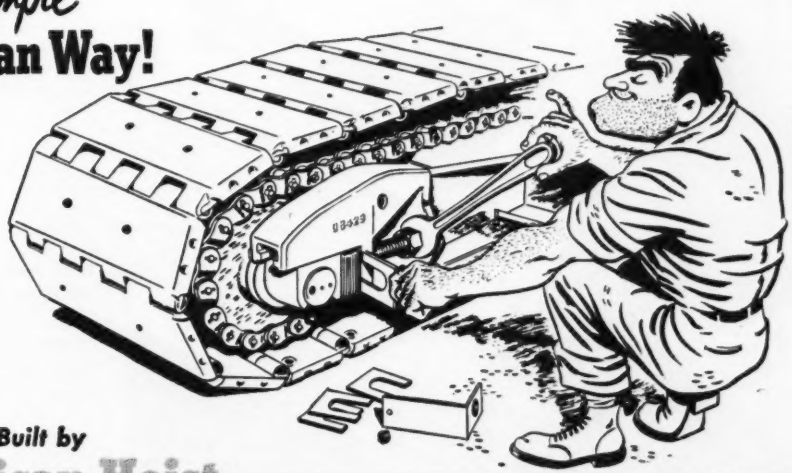
HAVE TO BE

....TO TAKE UP YOUR TRACKS?

....it's *Simple* on the American 375!

Insert screw jack—turn nut—insert the spacer—you are ready for business! Mister, that's as simple as you can make it! GIVE THIS A THOUGHT, TOO—NO threads to rust. NO bolts to break! Sound interesting? You can get all the details.

or this *Simple* American Way!



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CLIPPED FROM NOVEMBER 1952 CONSTRUCTION METHODS

American Hoist & Derrick Co.
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Heavy Rugged Powerful

PUBLIC UTILITY AUGER DRILL

Without disturbing the surface! A standard model McCarthy Public Utility Drill recently bored a 12" diameter hole to a horizontal depth of 180 feet, under railroad tracks, to lay a gas main at Alliance, Ohio. McCarthy Utility Drills bore holes from 4½" to 24" diameter under roads, buildings, railway tracks, landscaped grounds, etc., for laying gas, water, power lines and for drainage purposes.

SELF-PROPELLED HORIZONTAL AUGER DRILL

Produces 40% more 6 to 8-inch blast holes per day. Works up to 120-foot horizontal depths, using 6-foot interlocking auger extensions. Bill Mathews, of Canton, Ohio, drilled 1800' of 6" diameter holes in one day. Finger-tip hydraulic carriage control permits selection of any drilling speed up to 6 feet per minute. Four individual self-locking jacks maintain correct drilling level. Over-all length: 12 feet; width: 5 feet 8 inches.

VERTICAL AUGER DRILL

A real time-saver for 6 and 8-inch blast hole and exploratory drilling. Compactly designed for mobile mounting. Hydraulically controlled tower, with 8-foot square alloy shaft and chain coupling power combination results in smooth, positive drilling action. When in traveling position, the over-all height is only 7⅓ feet. Total weight: 4800 lbs.

THE SALEM TOOL COMPANY

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SALEM

★ JOB TALK ★

...About Scaffolds

REDUCE ACCIDENTS in construction. This is the hard-hitting, unselfish aim of the Construction Section of the National Safety Council.

Its September Safety News Letter features practical advice on the erection and use of scaffolds. CM&E gladly reprints it in full to help carry the safety "gospel" to every job.

When you get on to a scaffold, whether it's on the ground and you are to help raise it, or whether you get on to it from a window above, you are taking your life into your own hands. There are more ways to get hurt or have an accident on a scaffold than on any other piece of building equipment, and when there is a scaffold accident there is more than a 50/50 chance of it being fatal.

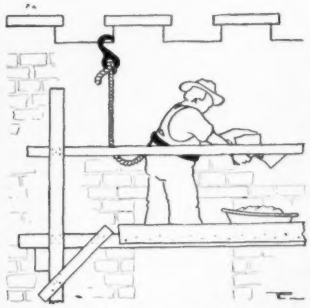
While swinging or suspended scaffolds are the most dangerous, built-up wood pole scaffolds can contain many defects in construction that will cause them to give way when used by too many workmen or when loaded with materials. Loading a built-up wood scaffold often is dangerous. It may not be nailed securely, nor sufficiently braced, or of proper sized members to withstand a heavy load. If it is built weakly, it may collapse in a high wind.

Basic Rules for All Types of Scaffolds

1. See that they are inspected properly before you use them.

2. If the scaffold is to be used at a height more than 12 ft above the

(Continued on page 10)



LIFE LINES are good safety insurance for many jobs that have to be done on scaffolds.

SIMPLICITY OF DESIGN

SHOVEL
CRANE
DRAGLINE
PULLSHOVEL

began with the FIRST NORTHWEST

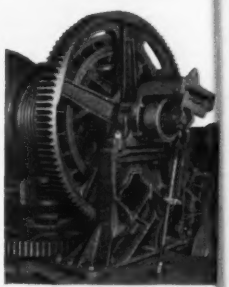
Simplicity *is* important! Northwest Shovels, Cranes, Draglines and Pullshovels were all *introduced* with this as a basic principle of design.

The early Northwests were characterized by a minimum number of shafts and gears. Drums were mounted side by side—All high-speed shafts rolled on ball or roller bearings—There were no high-speed chains with their devices for keeping them tight.

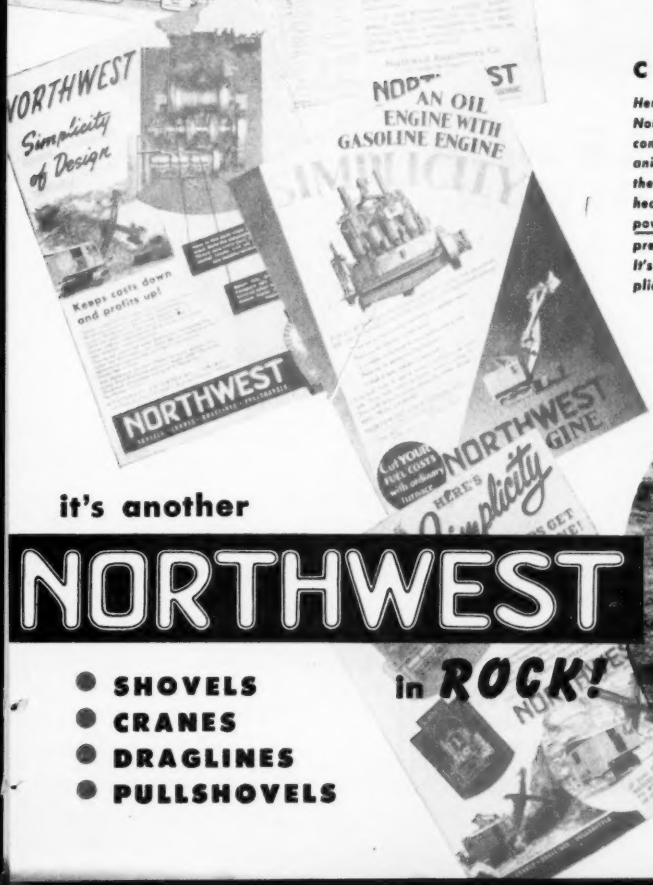
Northwest has preserved the principle of simplicity all through the years. Today's Northwests, too, are characterized by a minimum number of shafts and gears with ball and roller bearings on all high speed shafts. *Simplicity* means ease of upkeep, reduced "down time"—more output—and that is one of the main reasons why one out of every three Northwests sold is a repeat order. You can't have Northwest advantages without owning a Northwest!

NORTHWEST ENGINEERING COMPANY
1503 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois

SIMPLE CONTROLS



Here is the device that makes Northwest operation easier. It consists of a simple drum mechanism mounted on the end of the drum shaft. Through it the heavy clutches are shifted by the power of the engine. No compressors, no valves, no pumps. It's typical of Northwest Simplicity of Design.

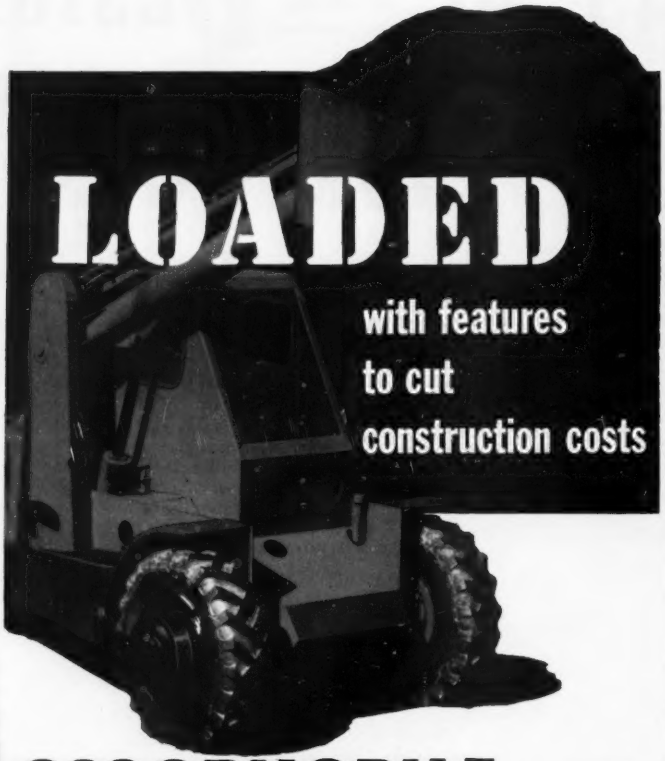


it's another

NORTHWEST

in ROCK!

- SHOVELS
- CRANES
- DRAGLINES
- PULLSHOVELS



LOADED

with features to cut construction costs

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FULL HYDRAULIC FRONT-END LOADER

Handle more loads per hour... and a heaping bucketful every time... with the all-hydraulic SCOOPMOBILE engineered to cut costs and accidents on every construction job.

Bucket on powerful hydraulic arm scoops a smooth arc and automatically levels for fast cycle lift to dumping position. Tricycle chassis and power steering give maximum maneuverability. Operator in clear-vision safety cab directs every operation with finger-tip controls.

Years-ahead design and rugged construction give long life and heavy-duty service.

It dozes . . . scoops . . . transports . . . backfills . . . loads all types of bulk materials.

- **Standard ¾ cu. yd. bucket scoops chassis-width track.**
- **Rated lifting capacity, 4,000 lbs.; standard discharge height to 8 ft.**
- **Heavy duty industrial engine and planetary drive axle with 3 to 1 reduction ratio gives ample reserve power.**
- **Can be driven at speeds to 20 m.p.h. and towed from one job to the next.**
- **Quick-change attachments include: Swivel type concrete hopper. Lift forks.**

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JOB TALK . . . Continued from p. 8

ground, see that it has a guard rail and toe board on the outer side.

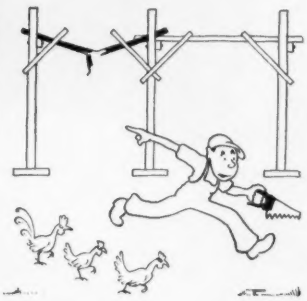
3. Keep your scaffold free from rubbish and waste material.

4. See that floor planks do not project more than 6 in. beyond the cross-beams, to prevent them tipping when you step on them.

5. Never leave tools or materials on your scaffold at night.

6. In winter time, be sure there is no snow or ice on the scaffold before you use it.

7. Notify your supervisor of any weakness you may discover in a scaffold before you use it.



***NOTIFY SUPERVISORS** of any fault you discover in scaffolding before you begin using it.*

8. Never work on a scaffold formed of loose plank supported on barrels, boxes, brick or loose tile blocks.

9. When you are working on a scaffold with other men working above you, be sure that your scaffold has an overhead protection.

10. Never work on a scaffold during a high wind or storm.

11. Never jump from a scaffold to the ground.

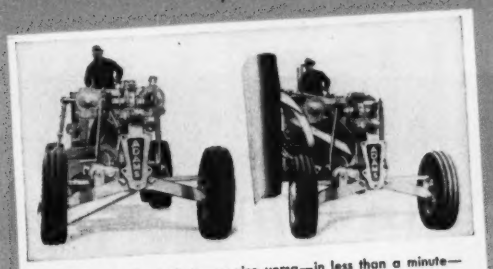
Erection of Wood Pole Scaffolds

1. See that all pole uprights are plumb.

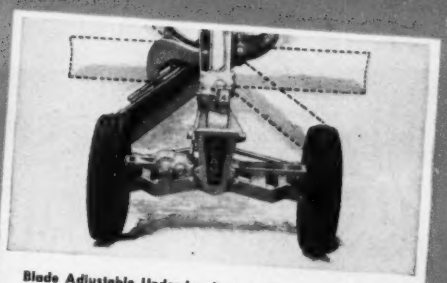
2. If the poles are spliced, see that the squared end of the upper section rests squarely on the squared end of the lower section, and that the two ends are properly and securely spliced together.

3. Be sure that the poles do not stand on the ground, but foot on

(Continued on page 18)

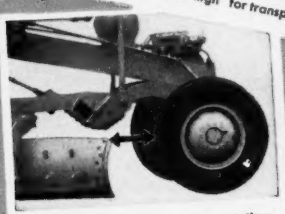


Ditch Cuts to Bank Cuts—or vice versa—in less than a minute—without mechanical adjustments. Saves time on alternate cuts.



Blade Adjustable Under Load—to deliver material where needed on grade balancing work while grader is in motion.

8 Forward Speeds—2 more speeds than most graders—an extra working speed and a higher "high" for transport.



Plenty of Blade Clearance—at tires and all other points. Operator gets all blade positions quickly, easily.

Big, Comfortable Cab—plenty of headroom for a tall man to stand and to see all his work—2-way adjustable seat.

Only ADAMS

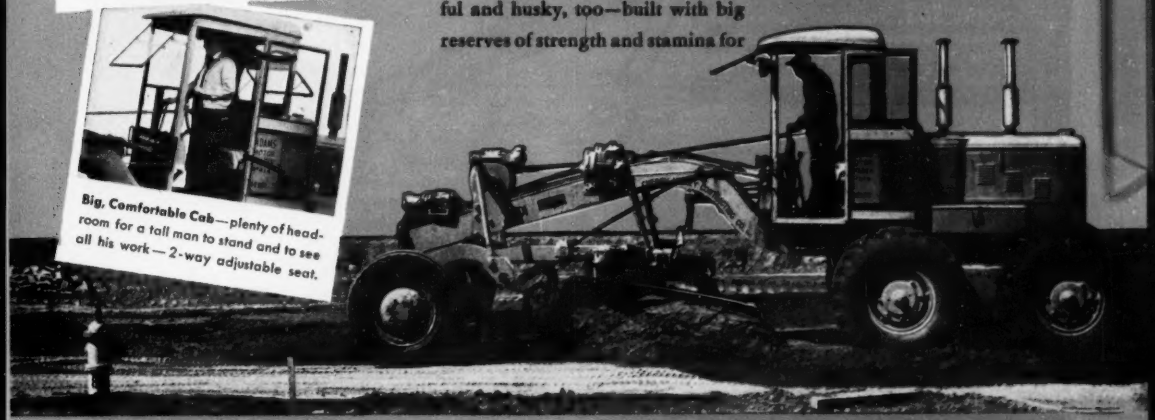
Gives you all of these big operating advantages

Yes, in Adams Motor Graders you get all of these important advantages—and many more . . . advantages that help your operator to do high-speed, precision work—at lowest cost.

Adams Motor Graders are powerful and husky, too—built with big reserves of strength and stamina for long-life dependability and low-cost maintenance.

Let your local dealer show you how Adams Motor Graders pay extra dividends the whole year around.

J. D. ADAMS MANUFACTURING CO.
Indianapolis, Indiana



Make your next motor grader an

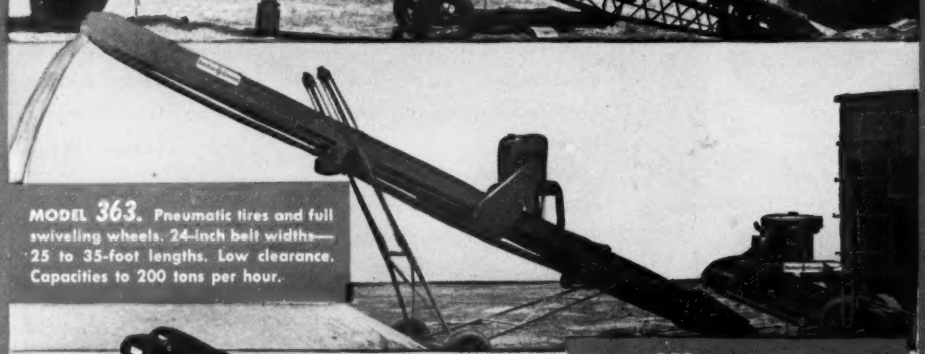
ADAMS

BARBER-GREENE HAS THE
PORTABLE CONVEYORS YOU NEED

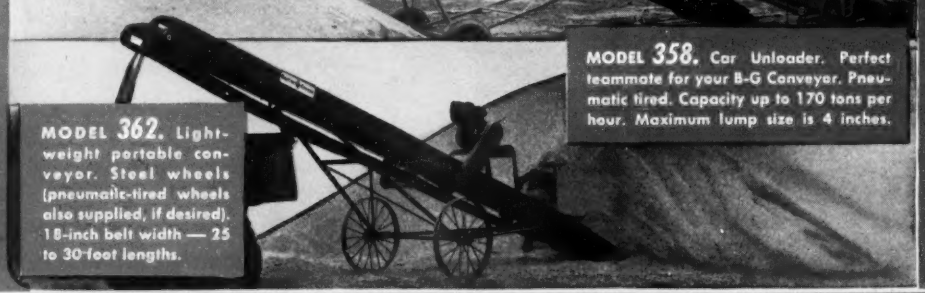
Here are three standard B-G Portable Conveyors together with B-G Car Unloader . . . all available for prompt delivery from your B-G distributor. These skillfully designed and ruggedly built machines will—within the limits of their capacities—provide you with the most efficient and economical method of handling sand, stone, gravel, coal, coke, ashes, wet concrete, chemicals, bags and boxes.

In addition to the models shown, Barber-Greene also builds larger capacity portable conveyors. Why not check with your B-G distributor for complete information on portable conveyors?

MODEL *374.* Heavy-duty, Pneumatic-tired—tow it anywhere. Full swiveling wheels. 18, 24 or 30-inch belt widths — 33 to 60-foot lengths. Capacities to more than 425 tons per hour.



MODEL *363.* Pneumatic tires and full swiveling wheels. 24-inch belt widths—25 to 35-foot lengths. Low clearance. Capacities to 200 tons per hour.



MODEL *358.* Car Unloader. Perfect teammate for your B-G Conveyor. Pneumatic tired. Capacity up to 170 tons per hour. Maximum lump size is 4 inches.

MODEL *362.* Lightweight portable conveyor. Steel wheels (pneumatic-tired wheels also supplied, if desired). 18-inch belt width — 25 to 30-foot lengths.

Barber-Greene

Aurora, Illinois, U. S. A.

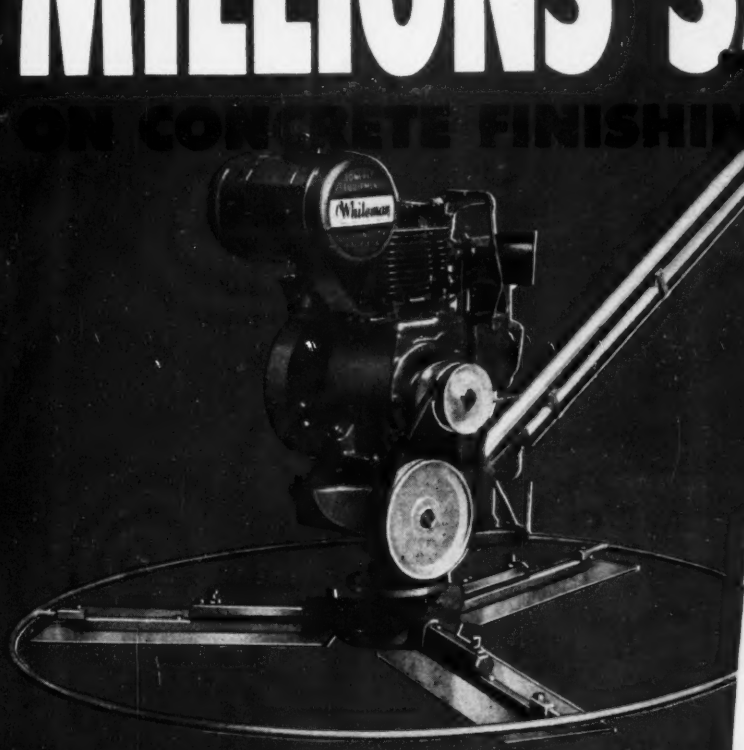
MILLIONS SAVED

ON CONCRETE FINISHING . . .

with

Whiteman

FLOATING-FINISHING MACHINES



IN USE 10 YEARS! STILL GOING STRONG

ROBERT E. McKEE
GENERAL CONTRACTOR INC.

Whiteman Manufacturing Company

Gentlemen:

The Whiteman Floating-Finishing Machines which we bought 10 years ago are still in use and doing a good job. We have purchased many more of these machines and find them to be highly efficient, dependable and great time and money savers on the job.

Very truly yours,

ROBERT E. MC KEE
GENERAL CONTRACTOR, INC.

By

LWitu
cc EF

During the past 13 years, Whiteman Floating and Finishing Machines have saved millions of dollars in construction costs for contractors the world over. Constantly improved over the years, the new Model "B" is finer, more powerful than ever. Heavier 1" spider arms maintain uniform pressure for the full width of trowels. Patented "snap-on" trowels for floating. Both sides of finish trowels are used—not just one. New Whiteman centrifugal clutch tightens belt automatically. Trowel pitch is easily adjustable when machine is in motion...another *exclusive* Whiteman feature. Gas engine or electric motor. Also available in Model "J" for smaller operations. You, too can save on concrete finishing! Send coupon for prices and literature.

Whiteman

THE LEADER IN CONCRETE EQUIPMENT

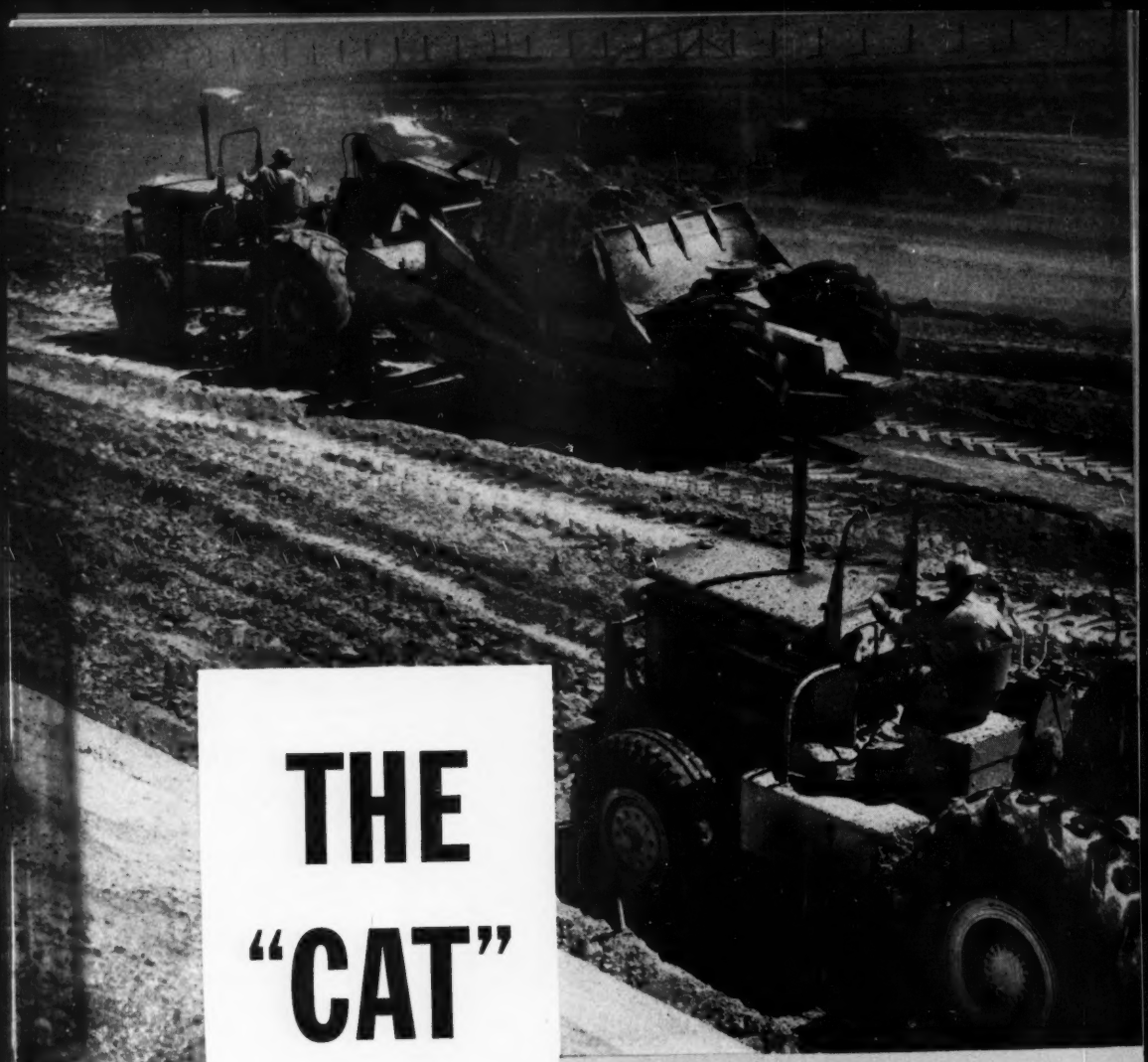
WHITEMAN MFG. CO., DEPT. C
3249 Casitas Ave., Los Angeles 39, Calif.
Please send prices, literature and name of distributor for ☐ Screeding Machines. ☐ Power Buggy ☐ Floating Finishing Machines.

Name_____

Firm_____

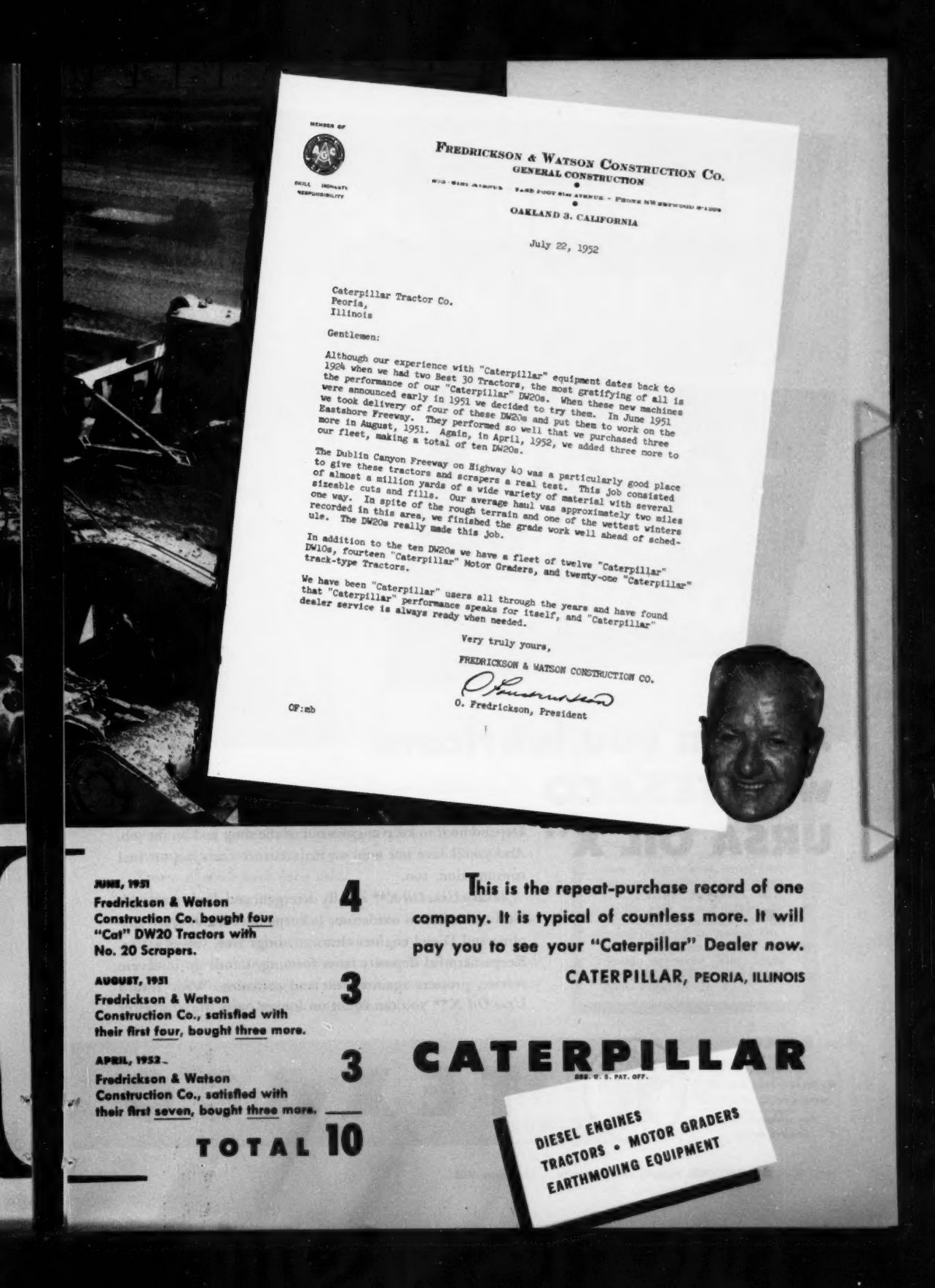
Address_____

City_____ Zone____ State____



THE "CAT" DW20

ITS RECORD SPEAKS FOR ITSELF!


MEMBER OF
SKILL HONESTY RESPONSIBILITY
FREDRICKSON & WATSON CONSTRUCTION CO.
GENERAL CONSTRUCTION
OAKLAND 3, CALIFORNIA
July 22, 1952
Caterpillar Tractor Co.
Peoria,
Illinois
Gentlemen:
Although our experience with "Caterpillar" equipment dates back to 1924 when we had two Best 30 Tractors, the most gratifying of all is the performance of our "Caterpillar" DW20s. When these new machines were announced early in 1951 we decided to try them. In June 1951 we took delivery of four of these DW20s and put them to work on the Eastshore Freeway. They performed so well that we purchased three more in August, 1951. Again, in April, 1952, we added three more to our fleet, making a total of ten DW20s.
The Dublin Canyon Freeway on Highway 40 was a particularly good place to give these tractors and scrapers a real test. This job consisted of almost a million yards of a wide variety of material with several sizeable cuts and fills. Our average haul was approximately two miles one way. In spite of the rough terrain and one of the wettest winters recorded in this area, we finished the grade work well ahead of schedule. The DW20s really made this job.
In addition to the ten DW20s we have a fleet of twelve "Caterpillar" DW10s, fourteen "Caterpillar" Motor Graders, and twenty-one "Caterpillar" track-type Tractors.
We have been "Caterpillar" users all through the years and have found that "Caterpillar" performance speaks for itself, and "Caterpillar" dealer service is always ready when needed.
Very truly yours,
FREDRICKSON & WATSON CONSTRUCTION CO.
O. Fredrickson, President
CF:mb

JUNE, 1951
Fredrickson & Watson Construction Co. bought four "Cat" DW20 Tractors with No. 20 Scrapers. **4**

AUGUST, 1951
Fredrickson & Watson Construction Co., satisfied with their first four, bought three more. **3**

APRIL, 1952
Fredrickson & Watson Construction Co., satisfied with their first seven, bought three more. **3**

TOTAL 10

This is the repeat-purchase record of one company. It is typical of countless more. It will pay you to see your "Caterpillar" Dealer now.

CATERPILLAR, PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

ENGINES DO MORE WORK

...COSTS COME DOWN

...when you lubricate with TEXACO URSA OIL X**

Don't let excessive engine repairs and overhauls delay work and cut into profits. Lubricate with *Texaco Ursa Oil X***. Depend on it to keep engines out of the shop and on the job. And you'll save not only on maintenance costs but on fuel consumption, too.

*Texaco Ursa Oil X*** is fully detergent and dispersive, with high resistance to oxidation. It keeps both heavy duty gasoline and Diesel engines clean . . . rings free, valves active. Keeps harmful deposits from forming, stands up in severe service, protects against wear and corrosion. With *Texaco Ursa Oil X*** you can count on longer parts life . . . better

TUNE IN:
Tuesday nights
on television —
the TEXACO STAR THEATER
starring MILTON BERLE.

See newspaper for
time and station.

TEXACO

TEXACO

all-around performance.

For chassis lubrication, use *Texaco Marfak*. The best evidence that it gives longer lasting protection, reduces maintenance costs, is this fact: *More than 400 million pounds of Texaco Marfak have been sold!*

For wheel bearings, use *Texaco Marfak Heavy Duty*. It seals out dirt and moisture, seals itself in. Won't leak onto brakes. No seasonal change required.

For crawler track mechanisms, use *Texaco Track Roll Lubricant*. It guards against dirt and moisture, wear and rust for long periods; assures longer parts life.

FOLLOW THE TEXACO SIMPLIFIED LUBRICATION PLAN

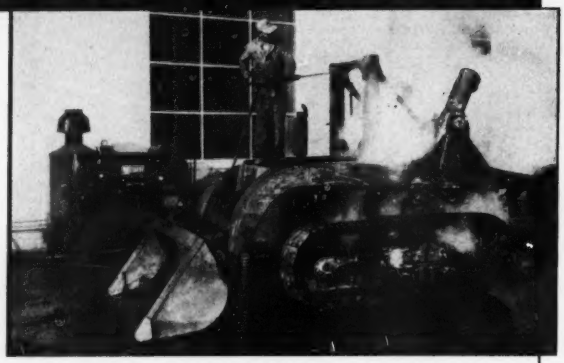
With the Texaco Simplified Lubrication Plan, all your major lubrication can be handled *with only six Texaco Lubricants!* Here's true simplicity, greater economy. A Texaco Lubrication Engineer will gladly give you full details. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

Faithfully yours 50 *for Fifty Years*

CLEANS TRACTOR-DOZERSHOVEL IN 2 HOURS WITH MALSBARY 300



5 Cleaning Actions, Plus Pressures To 400 Lbs., Blast Mud, Grease & Tars, Without Compound Changes

Previous cleaners took 6 hours to clean a TD9 tractor-dozershovel. Now Merrill-Brose Co., IHC dealer, Oakland, Calif., does the job in 2 hours with a MALSBARY 300 Heavy-duty Cleaner.

Here's why—

EXCLUSIVE PATENTED PUMPING SYSTEM replaces steam as source of working pressure on MALSBARY high pressure Models 250, 300 and 500. Cleaning efficiency is not limited to steam formed in the coils.

5 DISTINCT CLEANING ACTIONS. High pressure steam cleaning (to 325°F.); high pressure hot water; high pressure cold water; low pressure wet steam; and low pressure warm water. Only MALSBARY offers you all 5.

PRESSURES TO 400 LBS. This is 2 to 4 times higher than steam vapor cleaners; enables MALSBARY to do jobs other cleaners cannot touch, such as removing road tars without changing to special compounds. This high pressure permits simultaneous use of hot solution gun and cold water gun on Models 300 and 500.

All MALSBARY heavy-duty models—250, 300 and 500—develop hot solution in 2 to 3 minutes; are available with oil or gas-fired burner; gas engine or electric motor drive; stationary, portable or trailer mount.

See for yourself how MALSBARY Cleaners cut cleaning time—check coupon and mail TODAY.

MALSBARY SINCE 1921 MANUFACTURING CO.

Room 211 • 845 92nd Avenue • Oakland 3, California

For small shops, MALSBARY 110 & 220 Steam Vapor Cleaners provide quick, efficient cleaning on motors, chassis, parts and maintenance jobs. Simple, rugged, gadget free.

25

I AM INTERESTED IN—

☐ On-the-job demonstration.

☐ Free booklets on MALSBARY Cleaners.

☐ "How To Make Efficient Use of Steam Cleaning" reprint.

NAME POSITION

BUSINESS

ADDRESS

JOB TALK . . . **Continued from p. 10**

***POLE UPRIGHTS** must foot on wood blocks and are nailed down to prevent displacement.*

wood blocks large enough to spread the load over a sufficient area to prevent settlement. Nail the end of the pole to the block to prevent displacement.

4. See that this block of wood is not less than 2 in. thick and placed on solid ground.

5. If a pole is set on a sidewalk or anywhere other than on a wood block, be sure that the pole is braced securely.

6. Be sure the splicing of the poles is not at the same level, but staggered.

7. See that supporting ledgers are long enough to extend over two pole spaces and overlap the poles at each end by at least 4 in.

8. Splice ledgers at the poles and never between them.

9. As the platforms are built up, see that the ledgers on which the lower platforms rest are left in place to brace and stiffen the poles.

10. Nail or bolt the ledgers securely against the inside face of the poles.

11. If ledgers become split when they are being nailed up, or because a heavy load is being placed on the scaffold, be sure that the scaffold is not used until the split ledger has been replaced. A split ledger should never be left in place and simply re-nailed.

12. Be sure that the platform planking is at least 2 in. thick, and laid with edges tight together.

13. When the distance from the ground to the lower platform of the scaffold is more than 5 ft, see

(Continued on page 22)

A new "Baby" has arrived!

LORAIN TL-10 TRUCK CRANE

for mounting on your new or used truck

now with the LORAIN TL-10

YOUR THEW-LORAIN DISTRIBUTOR CAN OFFER A CRANE FOR *EVERY* NEED

Even before the new TL-10 Truck Crane was "born", your Thew-Lorain Distributor offered the world's most complete selection of shovel-cranes on rubber. Now, with the new Lorain TL-10, he can better fill ALL of your needs. No need to shop — just stop at your Thew-Lorain Distributor!

ASK ABOUT THE TL-10 AT YOUR THEW-LORAIN DISTRIBUTOR

IT'S HERE — FOR THE SMALL JOBS

Now you can put the biggest name in crane power to work on your smaller jobs that do not warrant the investment in high production machines. *Now,* with a Lorain TL-10, you can profitably mechanize, at low cost, that multitude of lifting, loading and material handling jobs ordinarily handled by high-cost labor.

IT'S HERE — AT BIG SAVINGS

You can mount the new TL-10 on your truck—new or used—and get all the advantages of high-speed mobility. Or, you can mount it on barge, pier, dock, bin, etc., to lift or load faster — anywhere. You get big machine quality at big dollar savings.

IT'S HERE — AND IT'S A LORAIN

The new Lorain "baby" is a "chip-off-the-old-block". It has the famous Lorain "TL" quality — and fast, smooth operation. And it is an off-spring of the world's first truck crane built by Thew-Lorain more than 30 years ago. The new TL-10 has a pedigree you can bank on!

THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN®

NEW JERSEY TURNPIKE — loose sand footing doesn't stop four-wheel-drive.

Above Ground

or Below

HOLLAND TUNNEL pavement removal demands precise control, plus power.

PAYLOADER®

Versatility Pays Off

WHETHER on the New Jersey Turnpike construction or Holland Tunnel repaving, the combination of four-wheel-drive, large pneumatic tires and *power* of this big, compact 1½-yd. "PAYLOADER" tractor-shovel pays off. It has fast-action traction on all kinds of footing — crawler-like traction at far less maintenance expense — PLUS speed when you want it. It has *versatility* to work on sand, mud, snow or clay and to travel over streets and highways at 16 mph.

This "PAYLOADER" also gives you easy operation and maneuvering speed with power-boosted steering and four speeds in reverse as well as forward . . . and is available with gasoline *or* diesel power. Hundreds of contractors are enthusiastic owners and boosters and once you've seen an HM in action you'll understand why. You'll find them on all kinds of construction projects from turnpikes to tunnels. The Frank G. Hough Co., 706 Sunnyside Ave., Libertyville, Illinois.

WRITE for full information on the Model HM or other "PAY-LOADERS." There are seven sizes from 12 cu. ft. to 1½ cu. yd. capacity.

SAW CONCRETE OR ASPHALT WITH AMAZING

Clipper CONCRETE SAWS

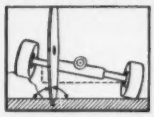
"SAWS RIGHT THRU"

Saw 12 feet per minute in Asphalt or 5 feet per minute, 1 inch deep, in cured limestone Concrete. With Clipper you can saw up to 6½ inches deep. Concrete Sawing is Practical and Profitable because Clipper Concrete Saws are Built with the experience of World's Largest Manufacturer of Masonry Saws.

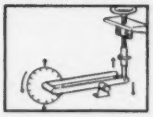
Model C-130 Power Packed

4 wheel — Perfect Control, tips back and turns on a dime

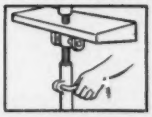
Experience Proves A Concrete Saw Must Have These Clipper Features:



1. Clipper "No Bind" Floating Three Point Suspension Automatically protects blade.



2. Positive Screw Feed Instant control raises or lowers blade smooth, easy.



3. Adjustable Depth Lock Set this handy stop for whatever depth desired.

4. Patented Spray Control its value is measured in increased Blade Life.

THREE ENTIRELY NEW MODELS

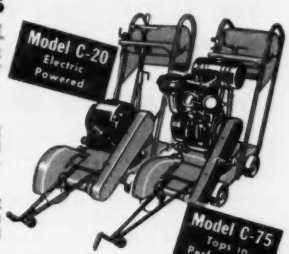
FAST — EFFICIENT — ECONOMICAL

Clipper Concrete Saws ***CUT*** through the toughest concrete, wherever patches, trenches, openings or contraction joints are needed.

SAW BEFORE YOU BREAK...

Eliminate radial cracks. Stop spalling. Have perfect jobs. Architects, Consulting Engineers, City and State Engineers are solving their problems by specifying "Saw before Breaking"

Utility Companies enjoy lower costs while improving Public Relations. Concrete Contractors praise the ease of getting the tough job done with new found profits!



Model C-20 Electric Powered

Model C-75 Tops in Performance

Patent Numbers 2338318, 2455113, 2492984 — Other Patents Pending — Printed in U.S.A.

GENUINE CLIPPER DIAMOND BLADES

Regardless of the Material you plan to Cut...Limestone, Flint, Gravel, Aggregate Concrete Green or Well Cured, or Asphalt . . . there's a Clipper Diamond Blade to cut fast and economically.

PATCH Saw clean straight lines, break smooth — Size and shape make no difference

TRENCH Gas, Water, Sewer, Electric, Telephone, new installations or old ones repaired

CONTRACTION JOINTS Highways, Streets, or Building Floors precision cuts eliminate hand tooling

POLES Installing new City lights? Clipper Concrete Saws prevent radial cracks

DRIVES—WALKS Prove the job can be small and still make concrete sawing profitable

Serving the World as the World's Largest Manufacturer of Masonry Saws

YOU CAN'T BEAT A CLIPPER

Here's the guarantee that has gone with every Clipper for more than 12 years to Prove it!

"Guaranteed to Provide Faster Cuts, with Lower Cost, with Greater Ease Anytime, Anyplace"

DON'T DELAY—WRITE TODAY

Completely descriptive literature tells the value of Clipper Concrete Saws. Get this information now! Tell us what you plan to cut!

SOLD ONLY DIRECT FROM CLIPPER FACTORY BRANCHES

Clipper "SAWS RIGHT THRU"

NATION-WIDE DIRECT FACTORY SERVICE

MANUFACTURING CO.

KANSAS CITY 8, MISSOURI

Cable Address: CLIPPER K. C. Mo.

PITTSBURGH • ST. LOUIS • NEW YORK • WASHINGTON, D.C.
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AUSTIN, TEX. • DETROIT • CINCINNATI • ATLANTA • BOSTON

FREE TRIAL

You Can Test—Actually Try A Clipper Concrete Saw On Your Job Without Obligation. It's Your Guarantee Of Perfect Performance.

MAIL COUPON NOW... for full details on..... FREE TRIAL

CLIPPER MANUFACTURING CO.

CONCRETE SAW DIVISION 2C

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Send FREE—literature, information, and prices on the NEW—CLIPPER CONCRETE SAWS

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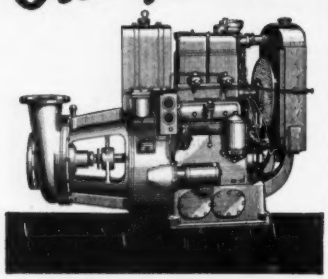
COMPANY _____

STREET _____

CITY _____ STATE _____

FOR LOW-COST TROUBLE-FREE *Pumping...*



you can depend on NORDBERG Diesel Pumping Units

• NORDBERG "4FS" Diesel Pumping Units are available in 1, 2 and 3-cylinder sizes, combining low cost, reliable power with efficient centrifugal pumps for practically all pumping jobs. Users report saving $100.00 a month over gasoline powered pumps. Capacities from 200 to 3200 gpm. at 20 to 220 ft. head.

Other Nordberg "4FS" Diesels are available as "packaged" generator sets, producing from 6 to 30 kilowatts . . . and as straight power units in sizes from 10 to 45 H.P. with stub shaft or clutch power take-off drives. For full details, mail the coupon now.

NORDBERG MFG. CO., Milwaukee, Wis.

NORDBERG
BUILDERS OF AMERICA'S LARGEST LINE OF HEAVY DUTY DIESELS

Mail this coupon Today

Nordberg Mfg. Co.
Milwaukee, Wis. 4-152-ICQM

Please send literature describing the full line of Nordberg "4FS" Diesel Power Units.

Your Name_____

Company_____

Address_____

City_____ Zone____ State_____

JOB TALK . . . Continued from p. 18

that a ladder or runway is provided, and that ladders are provided between the working platforms of the scaffold.

14. If portable ladders are used, see that the bottoms are fastened to the platform to prevent displacement, and that the upper end extends at least 3 ft above the platform.

Swinging and Suspended Scaffolds

1. See that all parts of these scaffolds are inspected daily.

2. Never use this type of a scaffold for the storage of material.

3. Not more than two men should work on a swinging scaffold at one time.

4. Test a swinging scaffold before use by raising it about 12 in. off the ground and loading it with at least four times the maximum weight that will be placed on it when being used.

5. See that life lines are provided for you and the other man working on a scaffold.

6. Each one of you should wear a safety belt properly attached to the life lines.

7. Never combine two or more swinging scaffolds with plank bridging between them.

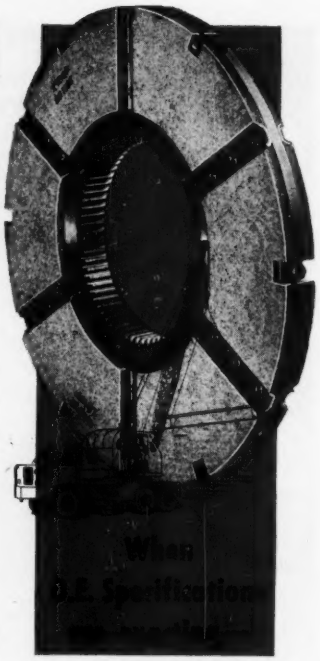
8. See that the platform of your swinging scaffold is lashed securely to the building to prevent it from swaying.

9. When you are ready to leave a swinging scaffold, lower it to the ground.

Ladders Too

GOOD LADDER maintenance is a must to keep a job safe. Although the ladder is a universal tool, many men are injured seriously in accidents involving this useful article. Three main causes are: (1) Broken sections; (2) improper setup; (3) unsafe practices of workers.

The purpose of a regular inspection and maintenance program is to find bad ladders and weed them out before they cause mishaps.



Thermoid's the choice!

High output on tough jobs . . . extra yardage that completes tight schedules on time . . . These are demands which Michigan Power Shovels and Cranes face every day, all year 'round.

Small wonder that Michigan's engineers chose Thermoid to help them develop a new single disc, double face, 12-segment clutch! With over 70 years experience in making friction materials for special applications like this, Thermoid was able to produce a long wearing, stable friction clutch segment which is ideal for the heat compensating and quick-change features of Michigan's clutches.

Thermoid makes a complete line of woven, molded and special types of Clutch Facings. Superior construction, plus Thermoid's close attention to individual needs, makes Thermoid Clutch Facings the choice of leading manufacturers in many fields.

Thermoid

Thermoid Company, Trenton, N. J.

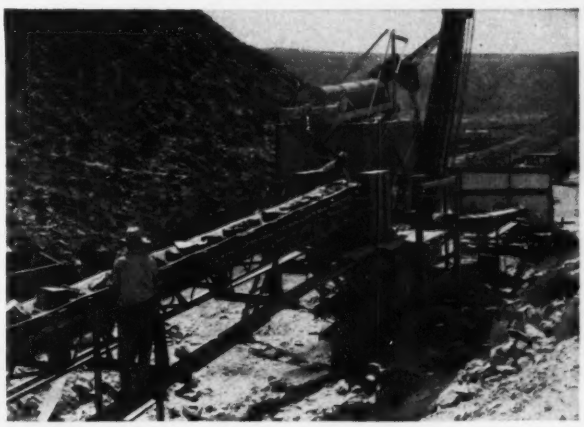
Nothing too rough or tough for Thermoid Conveyor Belting

Thermoid's long experience and continuing research *in the field*, pays off with real economy, maximum efficiency and greater tonnage for your belting dollar. Regardless of the size or kind of material —light or heavy, soft or abrasive, hot or cold, wet or dry—whatever the job, it's a good bet that Thermoid has solved the same or a similar problem with a belt that will do the job better.

In most cases, your Thermoid distributor can select the belt that will serve your needs most economically. Where unusual conditions exist, he will call in an experienced Thermoid sales engineer.

Get in touch with your Thermoid distributor or write direct for a copy of the Thermoid Conveyor Belting Catalog No. 3679.

It will pay you to specify Thermoid



Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Thermoid

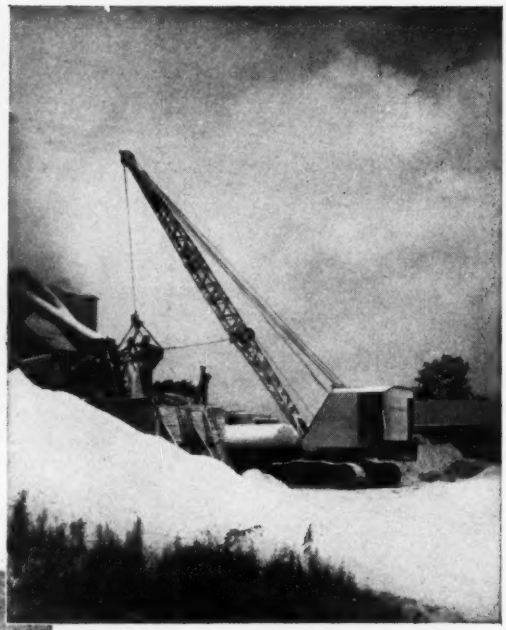
Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

SNAPPY swing
QUICK control
EASY operation
FINE balance

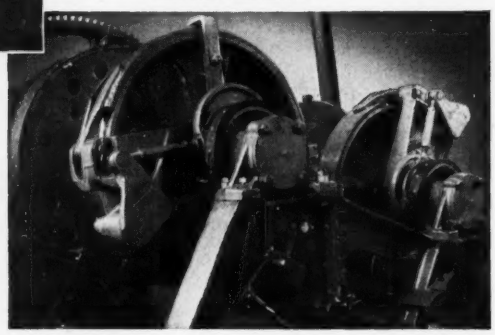
add up to accurate spotting of buckets with a BAY CITY

Whether you are loading bins and trucks or dumping on a spoil bank, the balanced design and easy flow of power of a BAY CITY will speed your materials handling and excavating operations . . . increase your profit possibilities.



With shovel, dragline or clamshell, the snappy swing, quick control, easy operation and fine balance of a BAY CITY make it easy to spot the bucket accurately and speed the digging cycle. No single factor makes the BAY CITY so long-wearing . . . so long lasting. It is a combination of heavy-duty design, construction and operating features which have made so many BAY CITY owners *repeat buyers* for up to 35 years. See your BAY CITY dealer for the full story or write today for catalog.

BAY CITY SHOVELS, INC.
BAY CITY, MICHIGAN



CHECK THESE FEATURES

- √ Fully Convertible
- √ Long, Wide Crawlers
- √ Alloy Cast Bases
- √ Tandem Drums
- √ Power Booster Clutches
- √ High Line Speeds
- √ Wide Vision Cab
- √ Pin-Connected Boom

209

Power booster clutches—single adjustment ▶

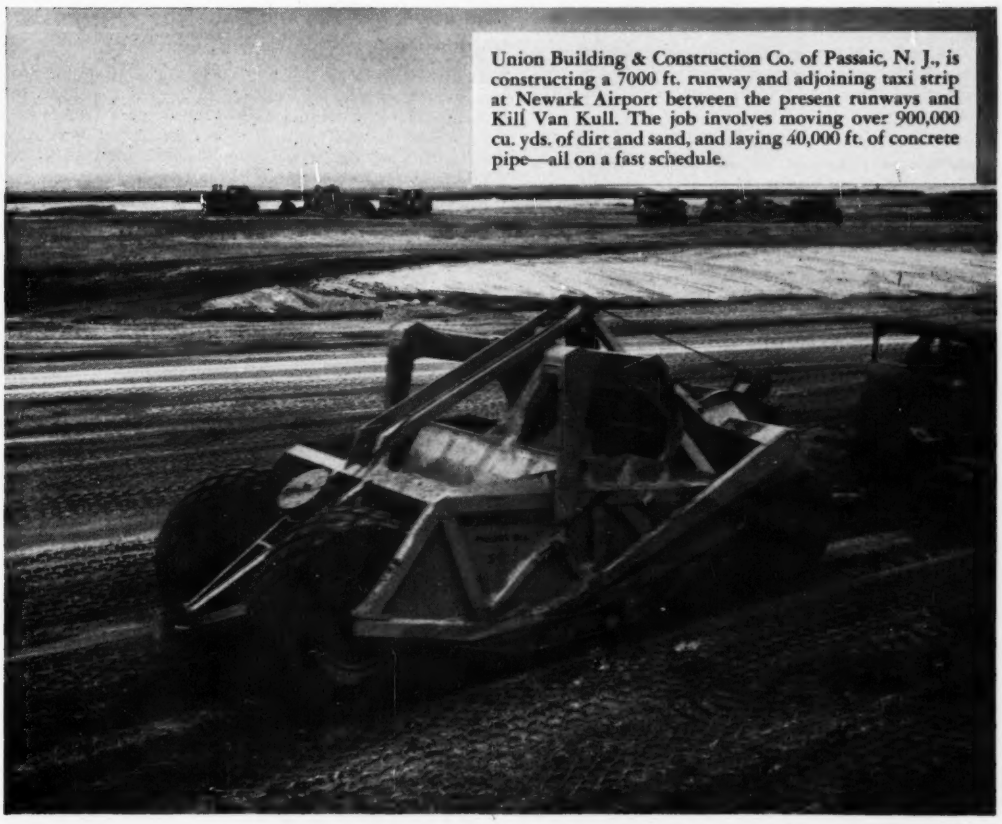
BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling

on Newark Airport Project



Union Building & Construction Co. of Passaic, N. J., is constructing a 7000 ft. runway and adjoining taxi strip at Newark Airport between the present runways and Kill Van Kull. The job involves moving over 900,000 cu. yds. of dirt and sand, and laying 40,000 ft. of concrete pipe—all on a fast schedule.

THIS is a rush job—the kind of job on which contractors don't take chances with their equipment. They want smooth, dependable operation and the best insurance they can buy against costly mechanical delays.

That's why Union Building & Construction Co. selected Gulf quality lubricants and fuels. And they're getting the kind of lubrication and fuel performance required to complete this important project ahead of schedule.

Write, wire, or phone your nearest Gulf office and arrange to use Gulf quality lubricants and fuels on your next job. They are quickly available to you through 1400 warehouses in 31 states from Maine to New Mexico.

GULF

It's Your Business . . .

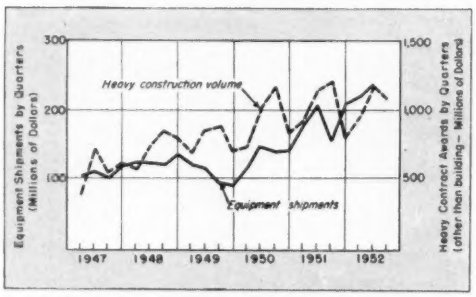
Facts and Figures of Construction

IS THERE ANY RELATION between construction activity and equipment production? Manufacturers would like to know, and so would the contractors. Let's take a look.

In the accompanying chart we have plotted earth-moving and excavating equipment shipment figures against contract awards reported to us on heavy construction, eliminating building operations, both on a quarterly basis from 1947 to date.

Comparison of Equipment Shipment Figures With Heavy Construction Contract Awards . . . Is There a Recognizable Relationship?

(Equipment data from BLS; contract awards from CM&E Business News)



At first glance it is hard to see any direct relationship between equipment shipments and contract awards. But a closer study of the two curves reveals what might turn out to be a rough pattern at least. You will note that equipment shipments seem to lag from 6 to 9 months behind the contract curve.

Perhaps this is an established pattern, or perhaps not. Only time will tell, but we are offering this comparison now for what it may be worth. We intend to rechart the figures once every quarter or so to see if the apparent pattern resolves into an established pattern. If a direct relationship can be determined, then manufacturers will be able to program their output more precisely, and contractors will be able to forecast equipment availability more accurately.

Contractors Move In and Out, Up and Down

AMERICAN CONTRACTORS certainly don't follow any steady pattern individually in conducting their business. Many of them are here today, gone tomorrow, or step up and down in yearly volume of work. The accompanying table reveals some interesting facts as to how they move in and out of the construction market based on an annual volume of $100,000 and over. These are number of contractors doing this amount of work as reported to our Business News Dept.

REPORTED	HEAVY HIGHWAY		BUILDINGS		TOTAL	
	No.	%	No.	%	No.	%
Both 1951-1952	1,665	33	1,255	27	2,920	30
1951 only	1,719	34	1,688	36	3,407	35
1952 only	1,684	33	1,707	37	3,391	35
TOTAL	5,608	100	4,650	100	9,718	100

Further analysis shows that of the contractors reported in 1952 as doing over $100,000, 54% were new to this classification, not appearing in the 1951 reports. In other words, contractors don't know who their competitors will be, nor do manufacturers know who their customers will be.

* * *

HOW CONTRACTORS may use losses or small profits on non-renegotiable contracts partly to offset excessive profits on contracts subject to renegotiation is outlined in "Losses and Small Profits in Performing Non-Renegotiable Contracts", available from Supt. of Documents, Washington 25, D.C., for 5c each or $2.25 per hundred copies.

SOME BIG CONTRACT AWARDS OF THE MONTH

Thomas O'Connor & Son, Inc., 230 Main St., Cambridge, Mass.: Unit 6, Edgar Power Plant addition at North Weymouth, Mass., for Boston Edison Co. Est. $30,000,000.

Cayuga Foundation Corp., 30 Vesey St., New York 7, N. Y., substructure bridge at Shavertown, N. Y. $1,336,-800.

Morrison-Knudsen, Inc., Boise, Idaho: Battery St. subway section for Alaska Way Viaduct, Seattle, Wash., $2,384,061.

Teichert & Son, Inc., and **Bressi & Bevanda,** Baldwin Park, Calif.: San Gabriel River Improvement for Whittier Narrows, U. S. District Engineer, Los Angeles, $3,747,319.

M. T. Reed Construction Co., Jackson, Miss.: Nitro-phosphate fertilizer plant at Pascagoula, Miss., for Gulf Improvement Co., $20,000,000.

United Engineers & Constructors, 1401 Arch St., Philadelphia, Pa.: Power plant, coke ovens, mills, blast furnace, for Bethlehem Steel Co. Sparrows Point, Md., plant $20,000,000.

Ebasco Services, 2 Rector St., New York City: Addition to Hawthorne Station, Kansas City, Mo., for Kansas City Power & Light Co., $15,200,000.

Girdler Corp., 224 E. Broadway, Louisville, Ky., and **Foster Wheeler Corp.,** 165 Broadway, New York City: Fertilizer plant at Lawrence, Kan., for Consumers Cooperative Assn., $16,000,000.

Like Top Hats and Snowballs

they Go Together

All-Wheel Drive and All-Wheel Steer

Getting down to fundamentals, the main job for any self-propelled grader is to move a satisfactory amount of material with the blade, and keep traveling in the desired direction. To move a satisfactory amount of material requires adequate traction. To keep traveling in the desired direction means that a way must be found to overcome the side thrust of the load on the angled blade . . . if such control is lacking, one end of the grader or the other slides sideways.

Traction and *directional control* . . . these are the fundamental problems of the designer. They are completely solved in Austin-Western "88-H," "99-H" and Master "99" Power Graders by exclusive all-wheel drive and all-wheel steer. They can never be completely solved in an ordinary front steer, rear drive grader.

All-Wheel Drive and All-Wheel Steer work as a team, each making the other doubly effective. All-Wheel Drive provides 30 per cent more Power-at-the-Blade. All-Wheel Steer provides all-around maneuverability not approached by ordinary motor graders. This is why Austin-Western machines go places where others cannot go . . . do things other graders cannot do.

In the photograph above, an Austin-Western "88-H" is using both All-Wheel Steer and All-Wheel Drive to work smoothly and easily around a short radius curve, which a front steer, rear drive grader could not negotiate. Rear steer provides the required maneuverability . . . the live power in the front drivers completely nullifies the tendency—always present in ordinary motor graders—for the rear drivers to increase the turning radius by skidding the dead front end sideways.

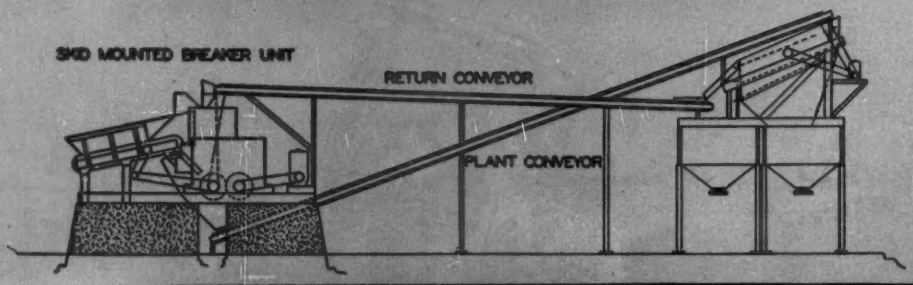
AUSTIN-WESTERN COMPANY Subsidiary of Baldwin-Lima-Hamilton Corporation **AURORA, ILLINOIS, U.S.A.**

BALDWIN BLH LIMA-HAMILTON

CONTROLLED IMPACT ACTION

Get BIG PLANT TONNAGE

at ROCK BOTTOM COST!



with a PMCO IMPACT MASTER HEAVY DUTY IMPACT BREAKER

Patent Pending

Step into big profit operations with minimum plant investment! A PMCO Impact Master setup eliminates secondary crushers and auxiliary equipment . . . saves on power, labor and maintenance costs . . . gives you top speed production of top quality aggregate.

With the PMCO Impact Master's high ratio of reduction, the complete crushing job is done in one fast controlled breaking operation. The breaking is accomplished by rigidly mounted rotor hammers, producing a top quality, uniform gradation cubical aggregate. Finished product size is easily controlled, and simple mechanical adjustments change the percentage of sizes. You can use the PMCO Impact Master for producing road building and concrete aggregates, and adjust it for the simultaneous production of aglime when desired.

PMCO Impact Masters have capacities up to 500 tons per hour. Let us give you profit-making details on the size that meets your requirements. Write today.

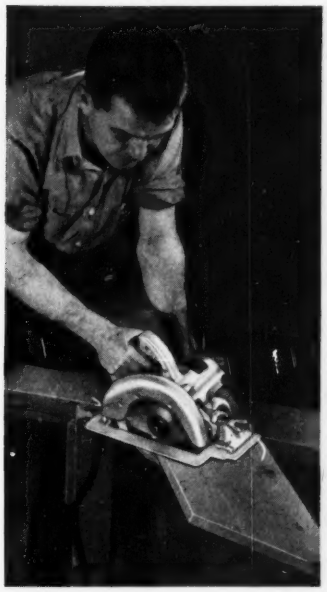
PMCO Impact Master Division, Universal Engineering Corporation, 625 C Avenue N. W., Cedar Rapids, Iowa

UNIVERSAL ENGINEERING CORPORATION division of PETTIBONE MULLIKEN CORP.

625 C Ave. N.W., Cedar Rapids, Iowa
Phone 7105

4700 W. Division St., Chicago 51, Illinois
Phone Spaulding 2-9300

Black & Decker Saws *are ten times faster than hand sawing, make every cut in all building materials. They are easy and safe to handle, fast adjusting, packed with power.*



Black & Decker Drills *come in 25 models from the ¼" HOLGUN®, a real "handful of power," to the big 1¼" Heavy-Duty Drill for heavy drilling and boring jobs.*

Black & Decker Hammers *drive a wide variety of tools to drill or channel in brick, stone, concrete; chip, clean and scale metal; gouge, shape and notch timbers; and many other jobs.*

On job after job . . .

Black & Decker Tools

save money, muscle and man-hours!

HERE'S the power tool line built to be tougher than your toughest job. Operating efficiency starts with the power plant. All Black & Decker motors are designed and built by us—right in our own factory! And every tool is tailor-made for the jobs it's designed to handle. That's why B&D Tools last longer, are more compact, better balanced, light and easy to handle—with plenty of power to spare.

Tough jobs are normal jobs for B&D Tools. Sawing, drilling, hammering, sanding, grinding—Black & Decker Tools have a reputation for delivering more work per man, per hour, per tool! See your nearby B&D Distributor for demonstrations. Write for free catalog to: THE BLACK & DECKER MFG. Co., 630 Pennsylvania Ave., Towson 4, Md.

*Trade Mark Reg. U. S. Pat. Off.

Factory Service Branches in 33 major cities—

- **Fast Factory Service**
- **Expert Mechanics**
- **Genuine Parts and Accessories**
- **Fully Guaranteed Work**
- **Free Parking**

Jansen and Schaffer, contractors of Pekin, Illinois, use a Domor Road Widener to cut costs on their Route 116 road widening project. Note the level trench, the clean paving edge.

HOW THE NEW DOMOR ROAD WIDENER SLASHES COSTS!

The new Domor Road Widener is quickly and easily attached to any "Cat" Motor Grader. Your "Caterpillar" Dealer has full details on this cost-cutting tool — the Domor Road Widener! See him today or write direct.

Method: Make two regular blade cuts with your "Cat" Motor Grader . . . attach the Domor Road Widener to the blade . . . make *two* passes with the Widener.

Result: A trench of specified width and depth with clean, level bottom. Old pavement is scoured clean for excellent bonding edge. *You're ready to pour concrete.*

Savings: No costly hand labor necessary — *one* man, *one* machine does all the work. Clean, even trench cuts concrete waste. Preparation time is cut as much as 66%. Costs are cut in half!

DOMOR

ELEVATING GRADER
SNOW BLOWER
ROAD WIDENER

ULRICH PRODUCTS CORPORATION

ROANOKE, ILLINOIS

How many different oils and greases do you now carry to keep your earth-moving machinery running?

With Shell's "3-Barrel" plan you need only *three*!*

*SHELL RETINAX A GREASE

. . . a superior new multi-purpose grease for all types of heavy-duty automotive vehicles. Shell Retinax A Grease does the job of four or more specialized greases—yet only one gun is required.

Recommended for all grease-lubricated points on chassis, wheel bearings, universal joints, and water pumps, Shell Retinax A gives you better protection against excessive wear and washing out.

*SHELL SPIRAX EP†

. . . an exceptional "alloy type," Extreme Pressure gear oil. Shell Spirax EP is recommended for rear axles of the hypoid, spiral bevel, and spur gear types . . . and heavy-duty transmissions. It is extremely stable . . . has long-lasting anti-rust and film strength properties. Results: longer gear life, lower maintenance costs.

*SHELL ROTELLA OIL

. . . for all engine crankcase lubrication, Shell Rotella Oil is a new, fortified, extra heavy-duty lubricant which has set new standards of anti-wear, anti-fouling performance in high speed diesel and heavy duty gasoline engines. By maintaining clean engines and minimizing sludge formation, piston lacquering, ring and valve sticking, and port clogging, Shell Rotella Oil extends periods between overhauls, reduces parts replacement costs, and gives you reduced oil consumption.

†Some manufacturers recommend a straight mineral oil for gear lubrication. Your Shell Lubrication Engineer will suggest the proper lubricant in such cases.

SHELL OIL COMPANY,
50 West 50th Street, New York 20, N. Y.
100 Bush Street, San Francisco 6, Cal.

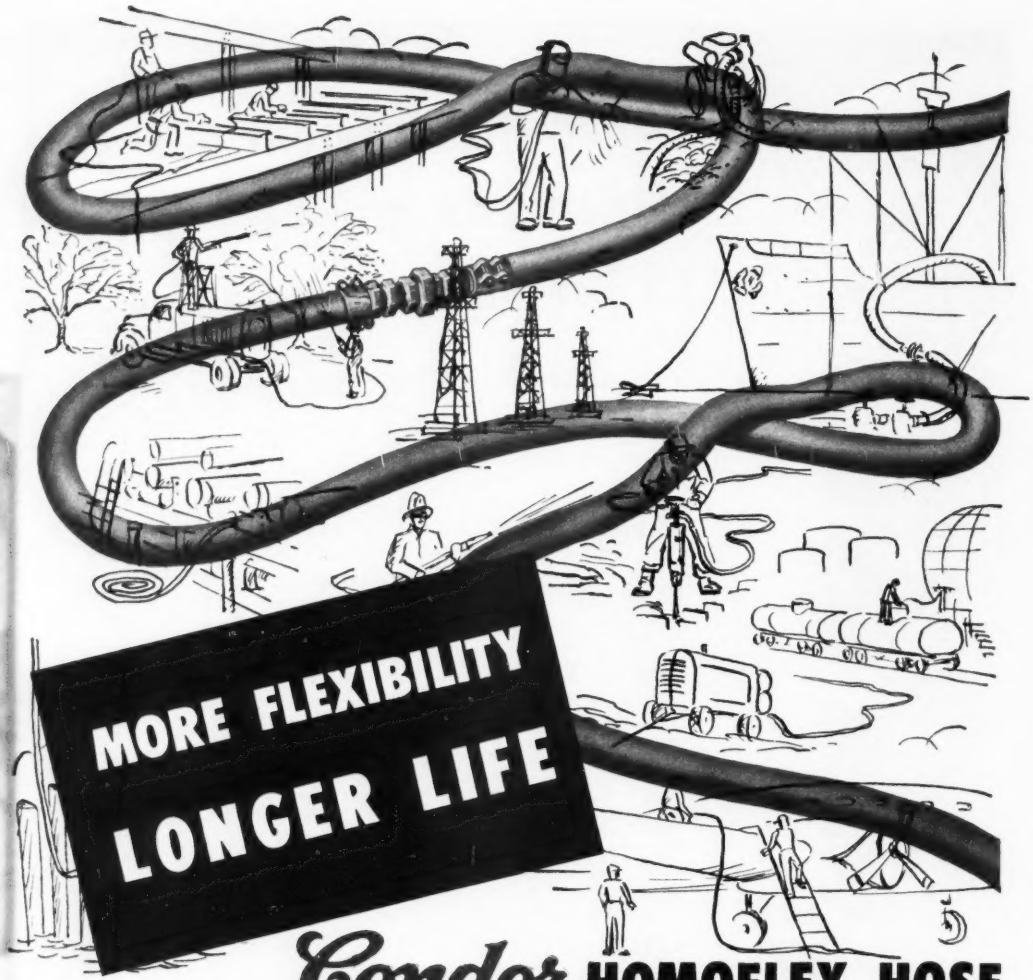
Please send me literature describing the 3-Barrel plan of lubrication.

Name _____

Company _____

Address _____

SHELL "3 BARREL" LUBRICATION

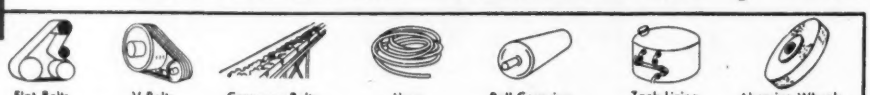


Condor HOMOFLEX HOSE

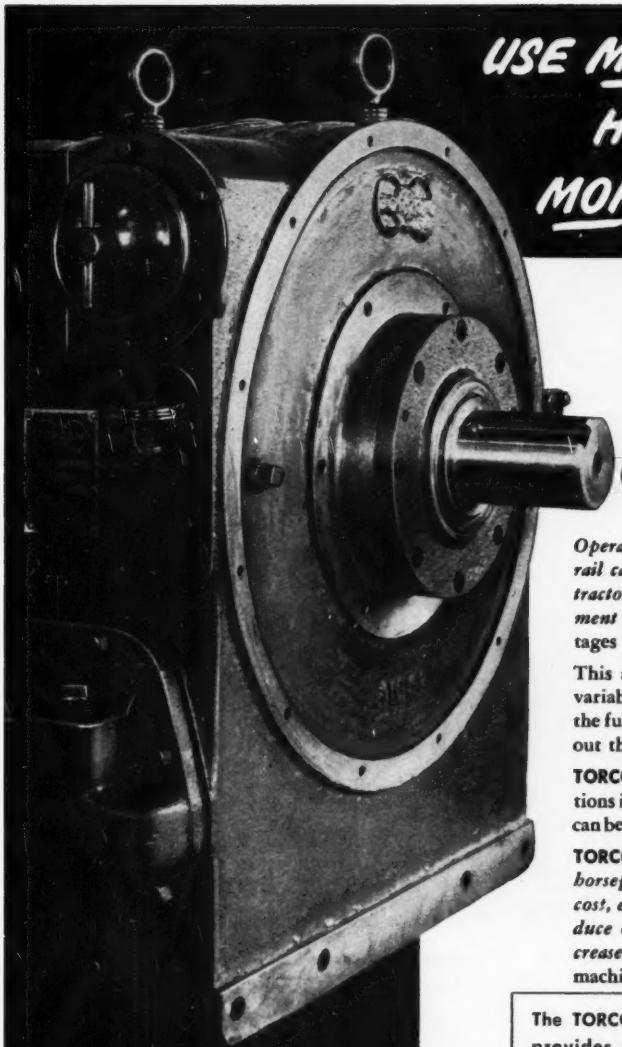
R/M engineers found a way to practically "homogenize" the wall of Homoflex Hose . . . By ingenious design, rubber tube and cover are blended together inseparably. The result, a hose wall with no pre-set twist, or stiffness. That's why Homoflex Hose is flexible as a a rope, light and easy to coil and uncoil. Naturally, it lasts longer too. Made for air, water and other standard uses, Homoflex Hose has additional advantages described in Bulletin 6879D. Write for a copy • As the background suggests, Raybestos-Manhattan makes hose for every use. Your R/M Distributor will show you samples and discuss construction advantages.

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.



Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Packings • Brake Linings • Brake Blocks Clutch Facings • Asbestos Textiles • Sintered Metal Parts • Bowling Balls



USE MORE OF YOUR HORSEPOWER MORE OF THE TIME!

with a TORCON TORQUE CONVERTER

Operators of shovels . . . draglines . . . cranes . . . rail cars . . . lift trucks . . . road machinery . . . tractors . . . mining machinery . . . logging equipment . . . oil well rigs are discovering the advantages of **TORCON TORQUE CONVERTERS.**

This automatic hydraulic transmission features variable speed and torque ratios, and facilitates the full utilization of your power source throughout the entire range of operation.

TORCON CONVERTERS are available for applications involving horsepowers from 30 to 600. They can be furnished with and without cut-off clutches.

TORCON units assure *maximum utilization of horsepower,* provide for *more production at less cost, eliminate shock to powered equipment, reduce operator fatigue* and *increase* the *service life* of your machinery.

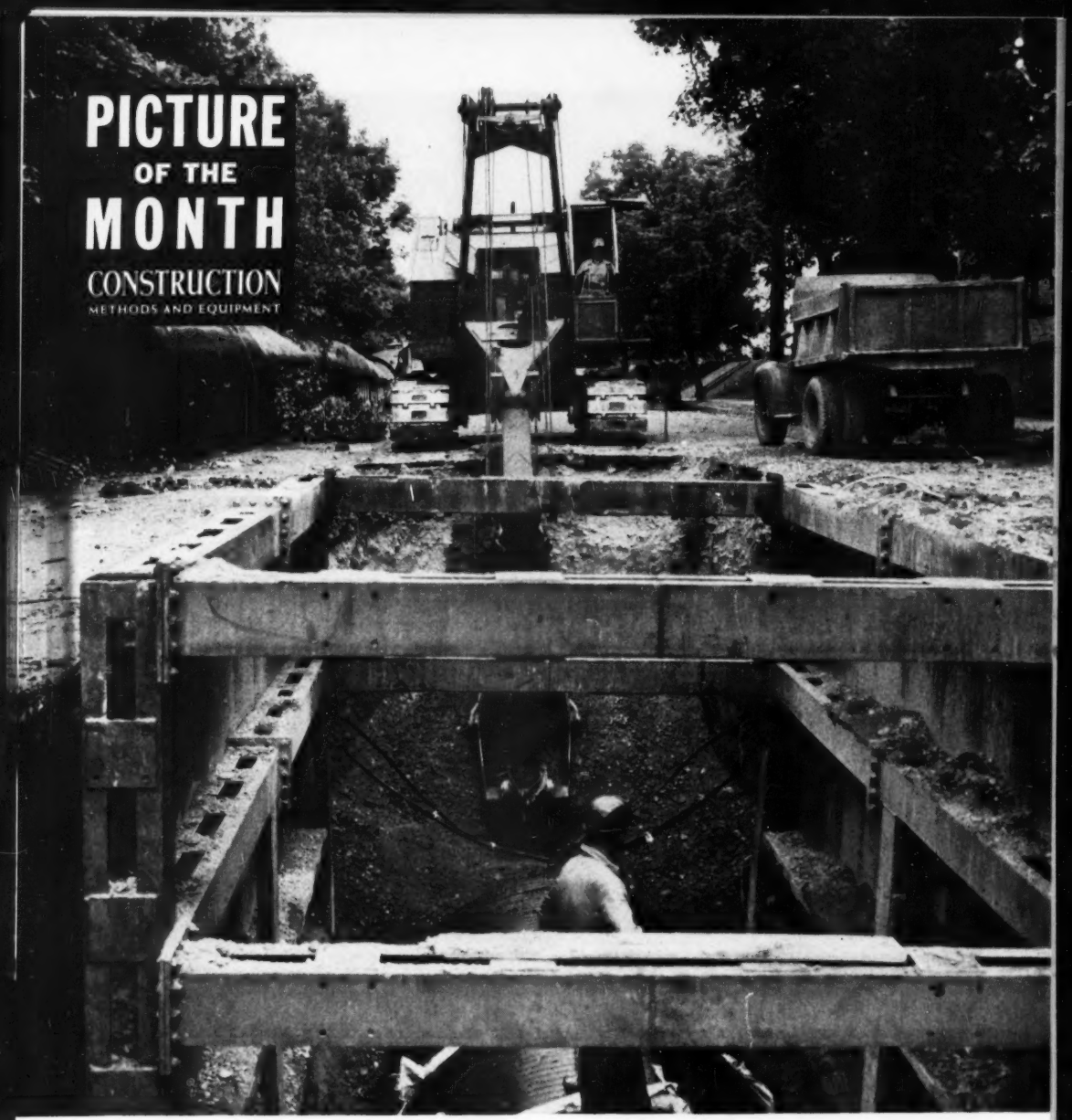
The TORCON torque converter provides superior automatic transmission for shovels, draglines, cranes, front-end loaders, tractors and road machinery.

USE MORE OF YOUR HORSEPOWER — MORE OF THE TIME

TORCON CORPORATION

714 TC

1194 FIFTH ST. • ASHTABULA, OHIO

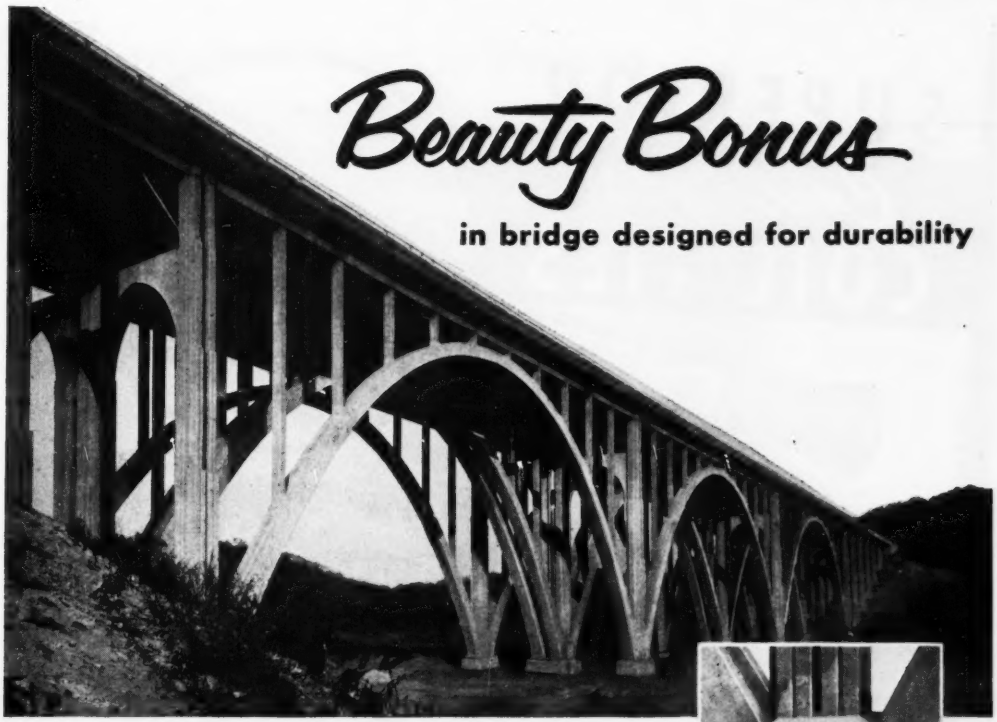


Sheeting-Excavator Team Speeds Schedule Safely

GOOD MANAGEMENT, prefabricated steel trench sheeting and a 1¾-yd backhoe are putting a million-dollar sewer job ahead of schedule by several months in Middletown, Ohio. S. S. Haddad, president of Haddad Construction Co., Columbus, designed the steel form, which is adjustable to varying trench widths. It is set into the excavation to protect workmen while a section of pipe is placed and joined. Then the backhoe pulls it forward into a newly excavated portion of the trench ready for another pipe section. Meanwhile, the Marion 362 excavator loads into four 5-ton trucks which haul around the block to dump on completed sections. The 96-in. by 18-ft sections of pipe are Armco Multi-Plate, asbestos bonded. A joint contractor on the project is the Burch Construction Co., Dayton.

Beauty Bonus

in bridge designed for durability



Superior surface appearance of concrete made with Duraplastic cement shows in this close-up view of an arch pier. Commercial Street Bridge, Penn-Lincoln Parkway, Pittsburgh, Pa. Designed by Pennsylvania Dept. of Highways. Contractor: Dinardo, Inc., of Pittsburgh.

DURAPLASTIC* gives *both*
—YET COSTS NO MORE

Superior concrete improves the appearance of the handsome design — and when it's more durable, too, that's even better!

Many engineers and contractors know from experience that concrete made with Duraplastic air-entraining portland cement requires less mixing water for a given slump and minimizes water gain and segregation. As on the bridge shown here, this results in generally improved surface appearance. The concrete is also fortified against the ravages of freezing-thawing weather, and paving resists the scaling action of de-icing salts.

There are more reasons why construction men like to build with Duraplastic. It gives a more plastic, more uniform, more workable mix that aids proper placement. That's why you'll want to specify Duraplastic on your jobs!

Yet, with all its advantages, Duraplastic sells at the same price as regular cement. Complies with ASTM and Federal Specifications. Your inquiries are invited. Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N.Y.

OFFICES: *Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.*

*"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

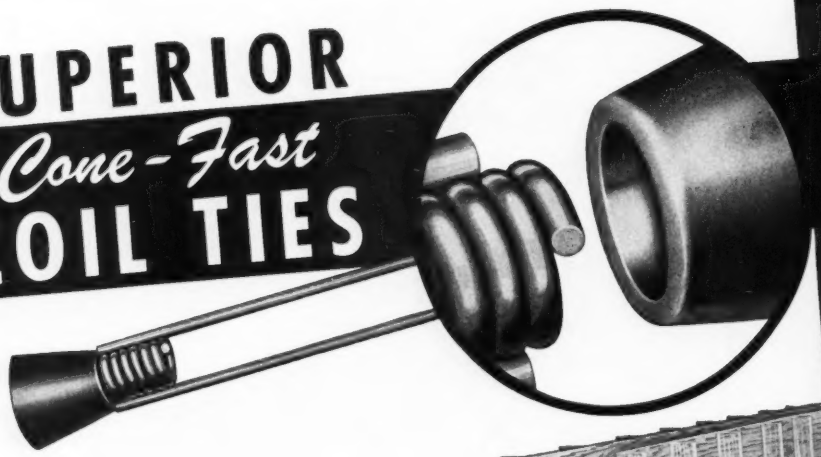
ATLAS® **DURAPLASTIC**
AIR-ENTRAINING PORTLAND CEMENT

CM-D-141

Makes Better Concrete at No Extra Cost

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network*

SUPERIOR
Cone-Fast
COIL TIES

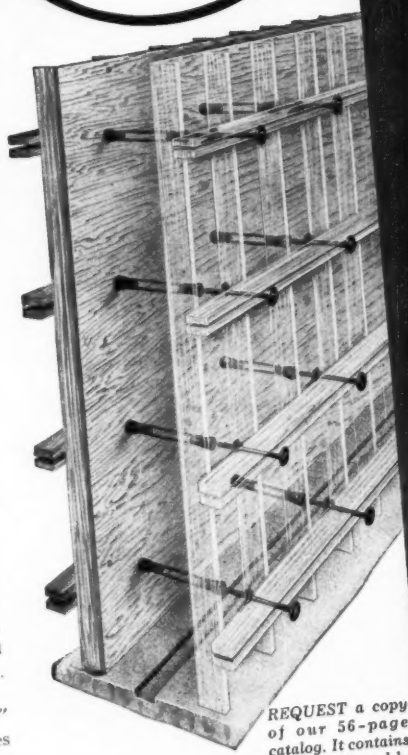


YOU CAN CUT YOUR FORM COSTS!

Because the cost of form work is a prime factor in the total cost of bridge piers and abutments, retaining walls, filtration and sewage disposal plants, and other engineering projects, it is obvious that the forming phase offers the greatest opportunity to save material and reduce labor costs.

The use of Superior Cone-Fast Coil Ties is one direct means of cutting costs and here's why: The *exclusive* feature of this tie is the extension of the coil beyond the ends of the wire struts (enlarged detail above) which allows a reamed Coil Cone to be fitted snugly in place before the opposing panel is erected. No separate gadgets are required. Cone-Fast ties are practically a "must" when large panels are used on walls where the workman cannot get inside the forms. Cone pointed Coil Bolts are easy to engage because of the large square openings in the cones. Bolt Holders (shown on panel form) keep bolts and washer on panel when stripping and moving for reuse.

Cone-Fast Coil Ties are available for Coil Bolts ½" to 1¼" in diameter and can be used with all types of forms. All working parts are returnable. For maximum efficiency plan your form work with SUPERIOR Cone-Fast Coil Ties.



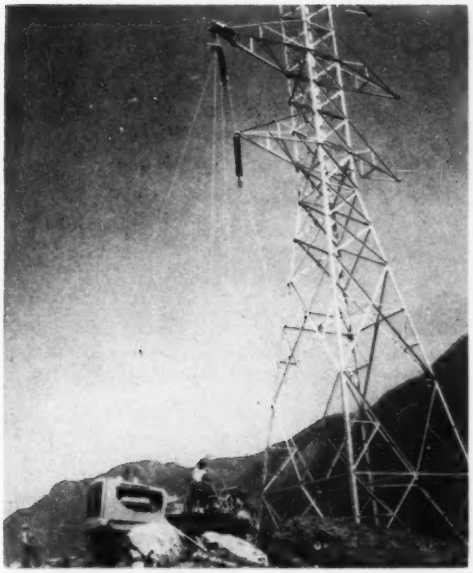
REQUEST a copy of our 56-page catalog. It contains a valuable table for spacing studs, wales, and form ties.

SUPERIOR CONCRETE ACCESSORIES, INC.

4110 Wrightwood Avenue, Chicago 39, Illinois

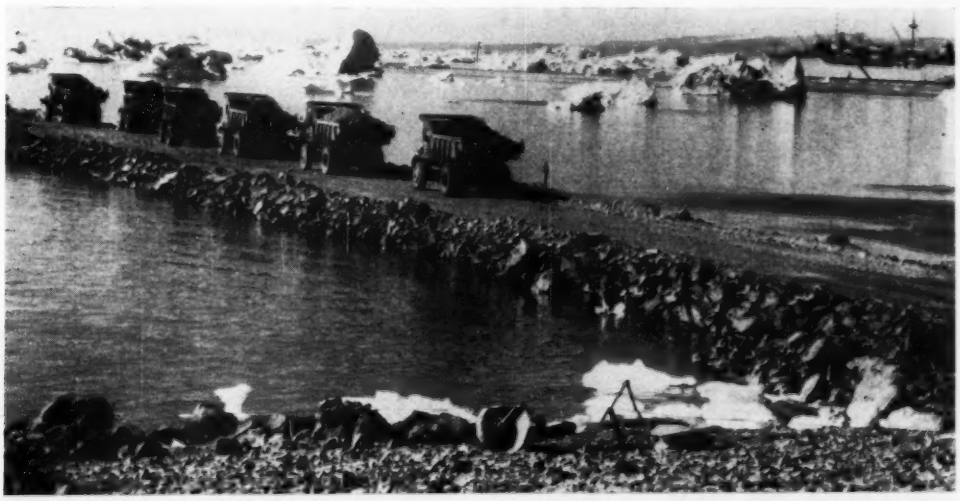
New York Office: 1775 Broadway, New York 19, N. Y.
Pacific Coast Plant: 2100 Williams St., San Leandro, Calif.

Construction News in Pictures . . .



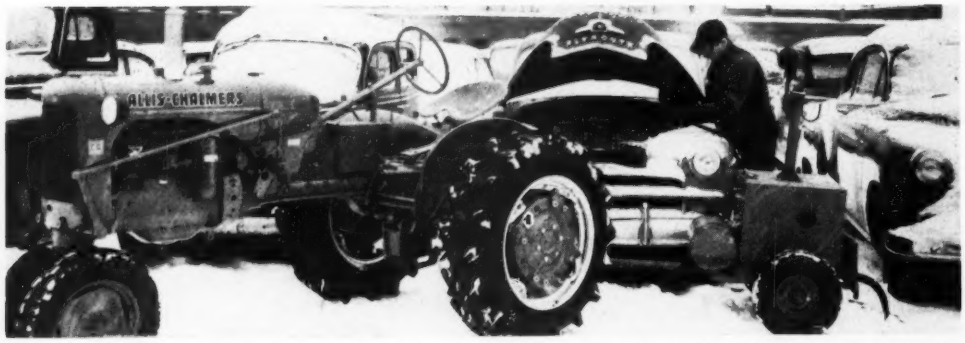
TOWER FOR THE HIGHLINE—Steel is going up against a background of mountains at the northern end of the Cascade Range in Washington as water power in the Pacific Northwest is being converted into electricity. This line, being erected at Newhalem, is on the Skagit River near Gorge Dam. The mountain-climbing Allis-Chalmers HD-19, with double-drum rear winch, handled heavy tower parts—now raises insulators.

TOWER ON THE MOVE—Traffic control tower at Miami, Fla., International Airport on its way to a new location one mile away. Structure is 68 ft high, weighs 110 tons. Two 21-in. I-beams supported the tower during jacking and moving. The $32,000 moving job was handled by E. W. LaPlante Co., Indianapolis, Ind., using 100-ton capacity dollies of their own design. Four 100-ton Joyce-Cridland air jacks raised and lowered the tower.

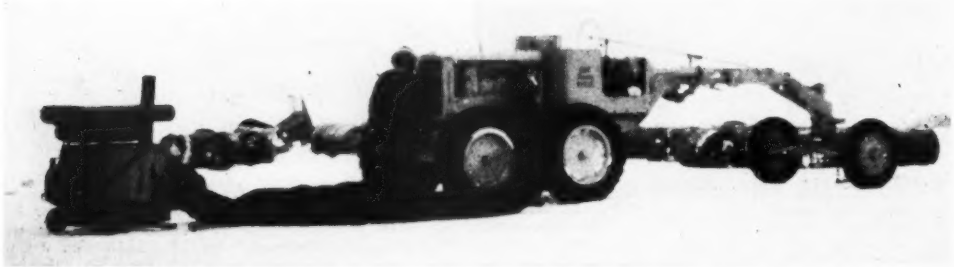


SKIRTING THE ICEBERGS—Six loaded Euclid rear-dumps go single file across a narrow causeway during construction of the Thule Air Base in Greenland. Pack ice is chief enemy, delaying delivery of equipment and supplies by water. Permafrost is chief problem. Permanently frozen earth supports structures, but ground under heated buildings must be kept cooled to forestall troublesome softening. Joint venture contractors Peter Kiewit Sons' Co. (Omaha) and S. J. Groves & Sons Co. (Minneapolis) are abetted ably by Condon-Cunningham Co. (Omaha) and Al Johnson Construction Co. (Minneapolis)—Eastern Publishers photo

Ease the Strain of Winter



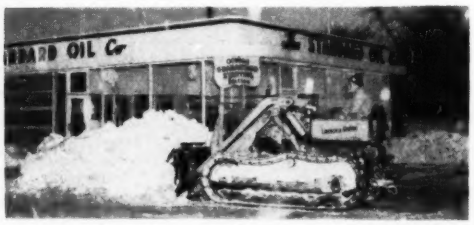
STRAIN ON BATTERY is eased by hooking up booster unit for cold weather starting. Allis-Chalmers uses this rig to start sluggish engines on parking lot on cold days. Contractors can do likewise with cold construction equipment.



STRAIN ON PARTS of Caterpillar 212 grader engine is eased by Herman Nelson heater before starting. This picture was taken in the Arctic with the temperature —32 deg, but pre-heating is profitable in cold weather anywhere.

STRAIN ON TRAFFIC soon comes to an end when construction equipment gets into the act. Here an Athey loader and Caterpillar 112 grader clear a busy Toledo street.

STRAIN ON HIGHWAY is relieved by grader fitted with drift-busting equipment. This Cat Diesel No. 12 in Minnesota has a V-type plow with stub wings and a snow wing.



STRAIN ON BUSINESS is relieved by contractor's standard Trax-cavator and Cat D4, as it shovels deep snow off the pavement around a service station in Cleveland.

Motorola 2-Way Radio

HELPS SET CONSTRUCTION RECORD ON NEW SUPER ROAD

Operational foreman on this major highway project keeps progress report up to date with instant radio communication.

On-the-spot reports, orders and trouble shooting is done direct from the superintendent's car using Motorola 2-way radio.

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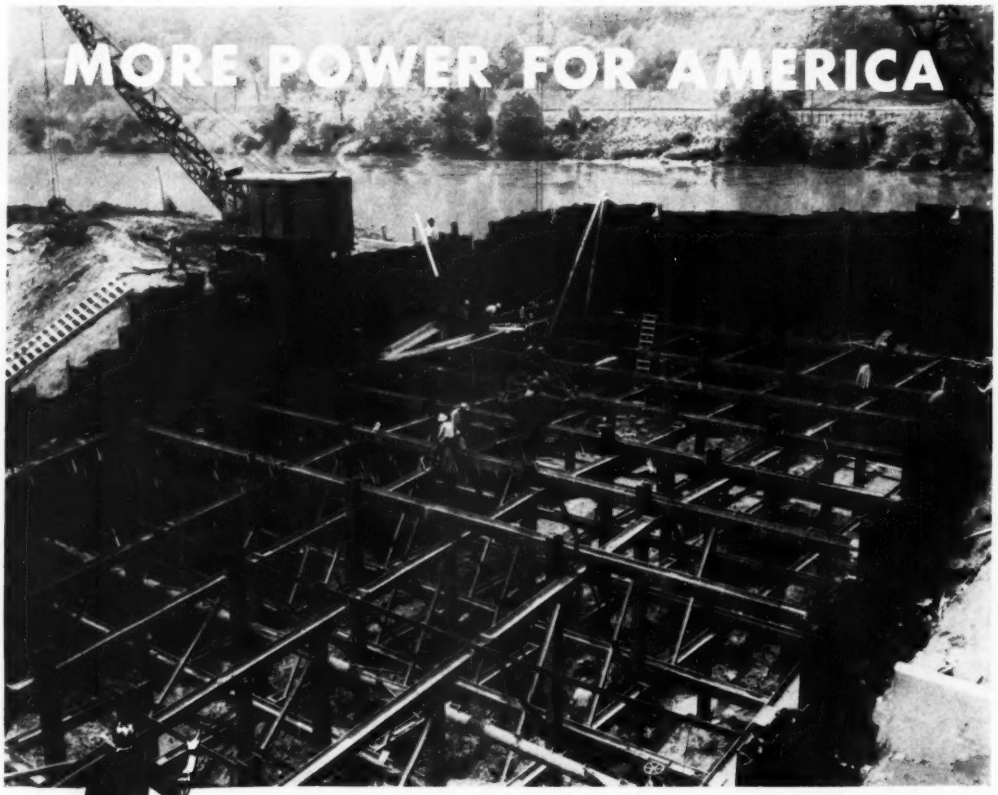

You're looking into the Screenhouse Cofferdam for the 400,000 Kilowatt Kanawha River Power Plant, Glasgow, West Virginia — a $40 million project now under construction by American Gas and Electric Service Corp., N. Y. for Appalachian Electric Power Co.

ONCE AGAIN THE MORETRENCH WELL-POINT SYSTEM (left foreground) KEEPS AN AG & E JOB MOVING ALONG—

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Number 11

CONSTRUCTION
METHODS AND EQUIPMENT

NOVEMBER
1952

Harold W. Richardson, Editor

How Long Will It Last?

BY THE TIME these words appear in print America will have elected a new president. But regardless of who goes into the White House next January, this construction business looks good for a long time to come. Fortunately, the destiny of construction does not depend upon the political affiliation of the President. Rather, it is closely tied in with the needs and demands of the people and with our ever-expanding national economy.

A year ago as we were closing up the biggest year in the history of construction, it appeared there might be a drop in volume of some 15% this year. But instead of falling off, heavy, industrial and building construction contract award figures are running 14% ahead of last year to date. And there is no let-up in sight.

Most encouraging is the fact that despite the siphoning off by continuing high awards, the backlog of essential, planned and authenticated projects has been steadily growing until it now reaches the stupendous total of 67 billion dollars. Of this total about 27 billions is for private construction and 40 billions is for public works. Earthwork, highways, public buildings, industrial and commercial buildings are the major classifications of projects on the backlog list.

This backlog contains only those defense projects that have been specifically announced. Therefore, it mainly represents the needs and desires of the people. It is an indication that the building of facilities even at the record current rate, is lagging behind the expansion of our economy.

Americans are crawling out of their former apathy and are now yelling for more roads to ease the intolerable highway congestion, for more schools to end the awful classroom situation, for more hospitals to keep pace with increasing attention to health. They are no longer satisfied with inadequate sewerage and water supply, with insufficient flood control, with inattention to land reclamation and conservation. Ever-increasing population and a constant rise in standard of living are behind the public's demands for these additional facilities.

Industry, utilities and business, too, must keep pace with the public demands for services and goods. This means constantly more and more factories, power plants, oil and gas lines, office buildings, warehouses and suburban developments. America isn't going to stand still unless we deliberately club it to death.

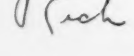
Of course some of the recent construction activity represents large defense and atomic energy plants. But huge as these plants may be, they are still construction projects, built by the construction industry using construction men, machines and materials. Many smaller contractors also participate in these big jobs, and right now Peter Kiewit Sons' Co. is asking for interested contractors to qualify with them for work on the Ohio AEC plant, as noted on page 184 of this issue.

Defense and military construction will last for some time but, of course, not forever. If the construction industry is smart, it will see to it that as defense work slacks off, we will pick up this vast backlog of civilian projects and get them going without delay. And, you contractors, that isn't a task for someone else to do—get in there and help promote the start of such projects yourself.

You are good American citizens, highly respected in your community; and when has it ever been a crime in this nation to sell your services and products to prospective customers?

The same goes for the materials and equipment branches of the industry. American business has shown a surprising tendency toward panic when the customers stop begging for products. Some day manufacturers are going to face a job of real selling and promotion.

But regardless of whether you are producing structures, materials or equipment, the market is there. All we have to do is turn out an intelligent job of converting the public's demand for construction into project and product realities.



RAW WINTER WILDERNESS. Ice-locked Tahtsa Lake with west Tahtsa Camp in foreground. Heavy equipment is routed 500 mi by rail, access road and barge to reach this isolated camp at the east portal of trans-mountain diversion tunnel. (A)*

ALCAN IN BRITISH COLUMBIA...

Construction Battles Difficult Access

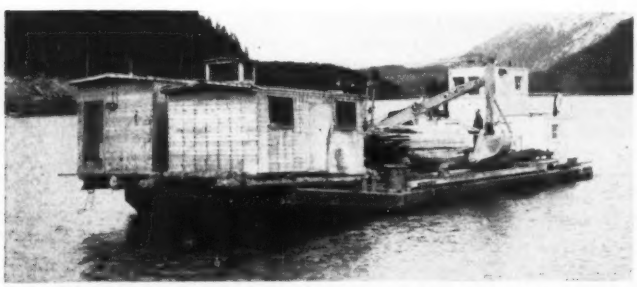
By L. L. WISE, Associate Editor

IN THE REMOTE mountain wilderness of western British Columbia private enterprise is spending more than half a billion dollars in a spectacular hydro power and plant development that will produce more than one-half million metric tons of aluminum annually.

Being built by the Aluminum Company of Canada, Ltd. (popularly called ALCAN, from which the job gets its name) the project extends over 5,000 sq mi of rugged peaks, deep gorges and lakes of the Coast Range, and long tidal estuaries along the Pacific coastline.

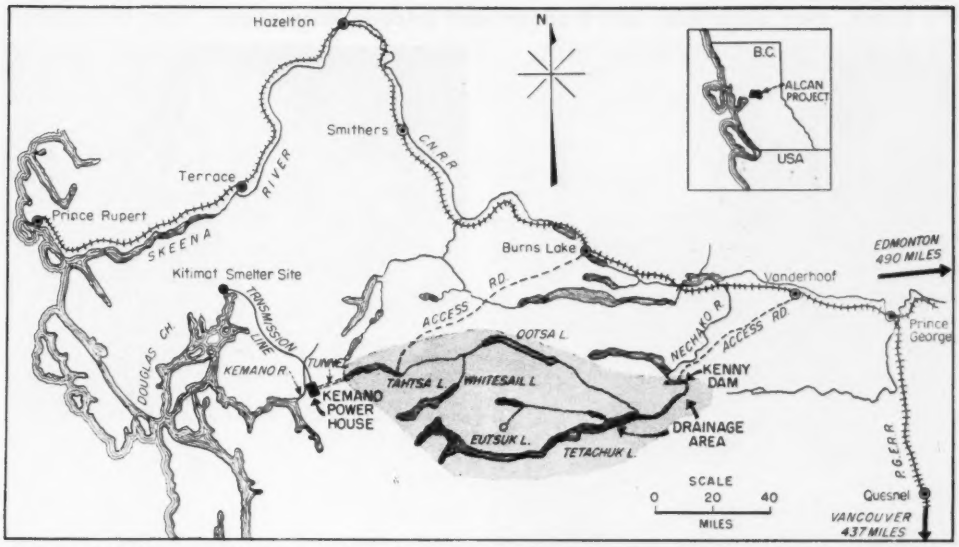
Here is a construction battle against difficult access and isolation, against unreal topography and weather conditions, and against time. Some parts of the project can be reached only by helicopter, others only by float planes, still others only by mountain lake barge lines, by cable tramway or by roads hacked out of wild mountain terrain.

Snowslides, landslides, year-round snow and north-country storms hamper construction at every turn. Above all, construction is a race against time, for with the tremendous investment involved, aluminum production must be rushed to earliest possible start. Construction got under way in January 1951; first aluminum is scheduled for September 1954.



BARGE TRANSPORT operating over 25-mi length of Tahtsa Lake is only surface access to East Portal Camp; connects with 75-mi access road to railroad at Burns Lake. (I)

• **The plan**—Alcan consists of six inter-related construction projects 150 mi from one end to the other. On the east slope of the Cascade Range is a group of connected lakes lying about 2,600 ft elevation, all having a common outlet through the Nechako River. The Nechako, flowing east and north, is part of the tributary system of the Skeena



SPREAD OF PROJECT covers 5,000 sq mi in northern B. C. mountains. Hydro construction, concentrated in Kemano and Kenney Dam areas, is by Morrison-Knudsen of Canada and subsidiaries: Kitimat smelter and town site will be built by Canadian firms.

FLOAT PLANES get in and out fast when lakes are free of ice, hauling top personnel and high-priority cargo around the far-flung project. This 22-yr-old German Junkers is on Tahtsa Lake. In winter, skis replace floats, permit contact with ice-locked areas. (I)

River that flows westward to meet the Pacific at Prince Rupert.

Kenney Dam on the Nechako, blocking the outlet of the lakes, is the eastern-most operation (CM&E October 1952, page 50). It will reverse the flow of the lake drainage area for, at the west end of Tahtsa Lake, most westerly of the group, a 25-ft tunnel 10 mi long is being driven to divert the waters through the Coast Range backbone.

From the tunnel, penstocks drop 2,600 ft inside the mountain to an underground powerhouse at Kemano, a mere 210 ft above tidewater. Here eventually 16 turbines of 140,000 hp each will be installed; three go into service in 1954.

From Kemano powerhouse a transmission line takes off across another range of mountains, crossing a pass at El 5,300, to Kitimat, 50 mi away at the head of navigable tidewater on Douglas channel.

At Kitimat, site of an Indian mission village that is being moved across the channel, the smelter plant and supporting town-site are being built on the shore area partly filled in.

Right now, construction emphasis is at Kemano. Morrison-Knudsen Company of Canada, Ltd., is building the powerhouse, including the dams, tunnels and transmission lines that go with it. M-Ks work covers a great area — everything from the switchyard at Kitimat eastward to the main storage dam some 150 mi away.

• **The job**—At Kemano there was first a 10-mi permanent road to connect with deep water at Kemano Bay where freighters, barges and float planes bring in supplies. Then there's the huge underground powerhouse (700 ft long, 81½ ft wide and 140 ft deep) involving a quarter million yd of rock excavation in itself.

Another major feature is the 10-mi long, 25-ft dia horseshoe-shaped power tunnel. There's a myriad of penstock tunnels, access tunnels, tailrace tunnels and the like between the power tunnel and the tailwater discharge into the Kemano River.

The 50-mi transmission line between Kemano and Kitimat rises near sea level, crosses the 5,300-ft

*Picture credits for this article are indicated as follows: (A) Aluminum Co. of Canada; (C) Construction Methods and Equipment; (I) International Harvester Co.—who also supplied supplemental information.

It's tough, even hazardous, but tractors and bridges build roads

SWITCH-BACK ACCESS ROAD for transmission line from Kildala to Hanging Valley is swamped out with TD-24 bulldozer. Snowslides caused plenty of trouble here earlier in the season. (I)

STEEL BRIDGE is a rare sight, but this is one of several structures on permanent 10-mi road between powerhouse and Kemano Bay waterfront facilities. Road cost $150,000 per mi. (A)

ATOP KILDALA PASS tractor is refueled with hand pump out of drums brought up by helicopter. Two TD-24s worked their way to top over deep snow, bulldozed downhill after snow melted. (I)

pass and descends down to sea level again. Final major feature is Kenney Dam. But it has been subcontracted to Mannix, Ltd.

• **The Roads**—About 170 mi of new roads will have been pushed through the mountains and muskeg by M-K before its Alcan contract is completed in the fall of 1954. The first road put through in 1951 connects tidewater docking facilities with Camp 5. This 10-mi all-weather, two-lane gravel road includes three major bridges. One of these is a $250,000 steel structure built by the Dominion Bridge Co. This road will be maintained permanently, as it is the only link from port to power plant.

A 104-mi road from Burns Lake, on the C.N.R.R. Prince Rupert branch, was pushed through to a supply camp located on East Tahtsa Lake. Down this road flow all supplies, equipment and personnel for construction of the main diversion tunnel.

In addition, a far more difficult road of 7 mi was pushed 2,200 ft above Camp 5 to the Horetzky Creek adit by a Morrison-Knudsen associate, the Northern Construction Co. of Vancouver.

The first section of the transmission line access road is an extension of the road from the dock, 7 mi up the Kemano River from Camp 5 to Camp 9 parellel to the transmission line right-of-way.

Part of the transmission line access road which carries more than 10 mi of wild, mile-high mountain range follows closely the route of the power transmission line. In places this road climbs almost a 1,000 ft per mi reaching grades more than 25% between the Kemano River valley floor, and the Kildala - Kemano Pass. Extensive switchbacks, miles of rock blasting, snow and landslides have slowed progress on this road. However, because of the remarkable feat of putting a crawler tractor on the top of the pass over steep, hard-packed snowslides, permitting pioneer grading to be done downhill, it was finished in September 1952.

Once an International TD-24 with a Carco Model J winch was established in the pass, another TD-24, a Berger Yarder and a compressor were pulled up, and Camp 11 was established on top. Pioneer

Helicopters make short work of a steep 5,000-ft climb to the top

BUNDLE OF LUMBER on its way via helicopter out of Kemano Valley up to camp site for transmission line at Kildala Pass at El 5,300. Big Sikorsky machine lifts 1,400 lb, makes round trip in 30 min. Loads are bound into bundles which are hooked to helicopter as it hovers overhead and flight begins without delay to supply high-level camps and tower-building operations. (C)

grading was started downward to meet the road coming up from Camp 9 and down in the other direction toward the road approaching up the Kildala Valley.

Most of the rock work was done with 16-ft slashes, drilled, blasted with 40% Formite dynamite powder. Loose rock, to a distance of 100 ft, over the road was scaled down by drillers tied with safety rope. International TD-24 crawler tractors with Isaacson angle, cable dozers and Carco Model J winches built fills, cleared blast debris and pioneered portions of the road. Ingersoll-Rand 500-cfm compressors with International UD-24 power plants drilled the sidecuts.

TWO-PLACE BELL HELICOPTER on skids at the Kildala Pass camp site in winter. These small machines are indispensable in survey work and for light-duty missions to remote areas. (I)

• **The winter**—During the severe winter months, work was made

Big tramway skip takes loads up to 20 tons to serve tunnel work

HUGE TRAMWAY SKIP, riding on 2½-in. cables, hauls up to 20 tons of men, equipment and supplies at one time from base camp near tidewater to penstock adit at El 1,600 and west tunnel at El 2,600. Cableway is 5,400 ft long, incline averages 35 deg. (C)

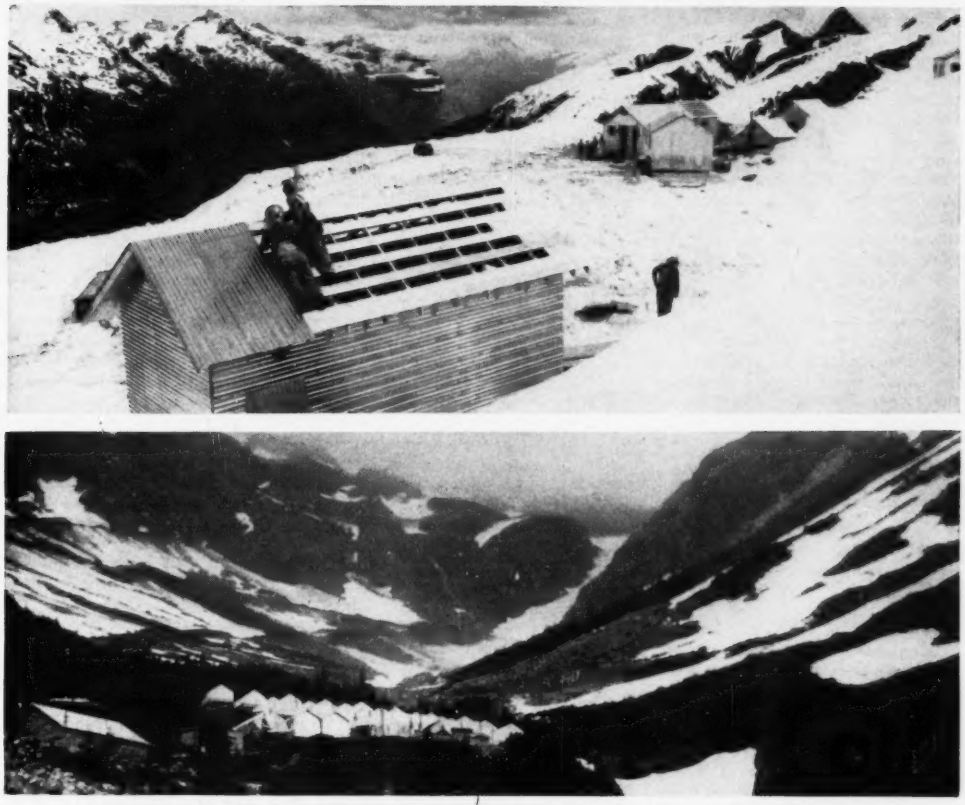
SKIP LOWERS to horizontal position for loading and unloading. Lumber is wheeled aboard on small rail cars and tied down for ascent. Normal speed is 500 fpm. (C)

hazardous by snowslides, one of which took out 70 ft of temporary road at night. The patching job took ten days. First, two men climbed high up the canyon face to get to the heading which had been cut off. Marooned on the heading were a compressor and an International TD-24 tractor with dozer.

The heading section of the broken road was 8 ft above the lip of the other section 70 ft away. This necessitated blasting through 8 ft of solid rock from the floor of the marooned road for quite a distance back from the break. Fuel for compressor and tractor was hauled across the gap with lines.

When the leveling was effected, large timbers, 100 ft long with 3-ft butts, were dragged up to the slide-out. Anchor bolts were installed in the edge of the isolated heading.

Camps keep step with construction; include aluminum units and tents



CAMP AT PASS (top) has aluminum buildings set up on perpetual snowbank 65 ft deep. (I) Though snow hangs on all summer, even at lower levels, transmission line workers keep comfortable in this tent camp (bottom) hauled in mostly by helicopter (C)

Heavy cables were threaded through these anchor bolts and back to the lower downhill section of the road. One end was attached to the Carco winch of an International TD-24 tractor and the other to the logs. Each log was then slowly drawn across and firmly butted on the other side. Small trees were lashed crossways on the supporting timbers and 6 in. to 1 ft of fill was dozed on the bridge to provide a surface.

While this difficult heading is being pushed up the pass from the Kemano side, other sections of the powerline access road are under construction on the Kitimat side. At Minette Bay on the tidewaters of Douglas Channel, a heading is being worked southeast through dense conifer forest and muskeg.

Ten mi farther along the coast of Douglas Channel is another stretch of road, supported by two camps. One heading is pushing up the Kildala Valley to the Kemano-Kildala Pass, and the other was pushed toward Kitimat to meet the Minette heading.

• **The tractors**—Directly below the pass, many switchbacks were benched into the rock with dozers and some blasting. International TD-24 dozers were leapfrogged up above the road heading to doze switchbacks downward. To do this, riggers would run a line from a Berger Yarder with a Fairlead winch through a block attached 400 ft upslope and then back to the TD-24's Carcow winch. Slowly the big machine would back up the steep slopes behind this cable over boulders, knocking down all but the largest trees in its way.

Here's how they got a crawler tractor atop the mile-high pass to put the power transmission line access road weeks ahead of schedule: The road leaves Kemano River at Camp 9 to climb up Glacier Creek Canyon, a 2,000-ft high gorge, thence through a high mountain bowl to the 5,300-ft Kildala-Kemano Pass, a distance of 6 mi.

A TD-24 was sent up the snow of Glacier Creek Canyon in an attempt to pioneer a road up into the steep, hard-packed snowfield 150 ft deep. It was proposed to level a possible camp site ahead, from which a road heading could be worked down to meet the one coming up.

After two days of hazardous going the operator had picked his way across a snow bowl to the projected camp site. Later Camp 10 for 120 men was set up here. On the verge of running out of fuel,

the tractor leveled off a small area, and a helicopter landed with fuel for the machine.

Quickly leveling off the whole camp-site area, the crawler again moved up the mountain. After repeated attempts it succeeded in reaching the top one week after it took off on the snow. Using the road pioneered by the lead tractor, another TD-24 pulling a Berger Yarder winch and a compressor mounted on timber sleds, reached the point 800 ft below the pass. With winch help from the first tractor, anchored on top, the second TD-24 made the pass with its equipment the next day.

Shortly thereafter Camp 11 was established on the snow in the pass area. All materials and supplies for this camp were flown in by helicopter, while the two dozers removed snow to solid rock and pioneered sections of the road.

They Worked Down

Meanwhile, five other International TD-24s were rushed up to the first camp hauling compressors, drill rigs and winches for highlines and supplies. From here they began working down toward the original heading still being blasted slowly up the canyon. These tractors, pulling Athey wagons, brought nearly all supplies and materials into this first snow camp.

By the time the snow melted from the open bowl area above timberline, most of the road requiring fill, cuts, talus shelf and benches in weaker rock had been made by the seven TD-24s working from the top down. And for the sections left to be blasted out of solid rock when the snow completely melted around them, there were plenty of compressors strategically placed up the bowl wall.

• **The helicopters** — Problems of supply for the isolated work have been tough. The best solution has been the helicopter. Techniques developed at Kemano are advanced beyond any yet used on construction work.

Take, for example, transmission line work. The 15 mi of line that crosses the 5,300-ft pass between the Kemano and Kildala Valleys is one of the two most critical phases of the work from a time standpoint —the other is the 10-mi power tunnel. Work season in the pass is limited to July, August and September. If M-K waited for a road to be built up the pass before starting work, half the season would have elapsed.

Helicopters were the only answer. First they carried materials to build and supply the high-level camps. Then they started supplying tower-building operations.

Small Bell helicopters had been on the job at the very start. They were indispensable in surveying work. But they carried only two men, or the pilot and 300 lb. And loads had to be balanced carefully on the outside and securely tied.

A Bigger Bird

Last May a Sikorsky S-55 was brought in. This machine lifts 1,400 lb. Methods were developed whereby the 'copter would hover over a prepared load, hook on and then take off for the pass. There the load would be deposited without the big bird having to land.

The big Sikorsky was so successful at this that a second was procured — with no little red tape difficulty. These craft are so important that strict orders prevent their use for any other purpose than supplying work on the transmission line. During the summer months they work continuously so long as good flying weather lasts. A round-trip to the pass takes one-half hr. And they refuel only each third or fourth trip.

• **The tramway**—Next to the efficient helicopters, perhaps the most spectacular transportation at Kemano is the aerial tramway that serves tunnel work high on the side of the Kemano River gorge. This lift has a 20-ton capacity skip that rides on two 2½-in. track cables. The cableway is 5,400 ft long and inclines on the average at 35 deg.

It is powered by a 300-hp motor and travels 500 fpm—except for loads in excess of 15 tons when speed is restricted to 200 fpm as a safety factor. Longest single span between the seven towers along the tramway is 2,000 ft. Under normal working conditions, the rig makes 9 or 10 round tips per shift.

Biggest load carried so far was an International TD-24 tractor (CM&E Sept. 1952, page 36). But it was stripped down from its normal weight of 35 tons to maximum of 19½ tons.

Landings and camps are at El 200, El 1,600 and El 2,600. These correspond to the Kemano River Valley floor, the penstock adit, and the west adit for the power tunnel.

• **The camps** — Housing and supplying the 4,500 workers on this widespread and isolated job presents unusual difficulties. The main camp at Kemano is the biggest, and some of the facilities there are of a semi-permanent nature. That includes in the main quonset-type barracks, mess hall, warehouses and offices. But there are many satellite camps serving tunnel adits, road and transmission line work. Some of these include semi-permanent buildings but others are only tent camps intended for a few months' service at the most.

The beach camp at Kemano Bay housed workers building waterfront facilities and roads, is now maintained to serve supply functions at the waterfront. Temporary camps for road construction since have been abandoned. Permanent facilities were built at Kemano.

Three road camps, now abandoned, served road building and clearing operations for the first 10 mi of transmission line. Two camps near the foot of the 5,300-ft high pass serve power-line construction. As the snows melted early this summer, camps were built high in the pass section. Because of the shortness of the July, August, September construction season in the pass, these were started even in advance of road contruction.

Supplies were brought in by helicopters and Athey wagons. These high tent camps are truly spectacular. A similar set of transmission line camps paraded up the mountain from the Kitimat side.

Men Like Small Camps

Many workmen prefer the isolated smaller camps to the bustle and confusion that can't help but surround the main Kemano camp. Result is they are contented to stay in such camps for weeks and months at a time.

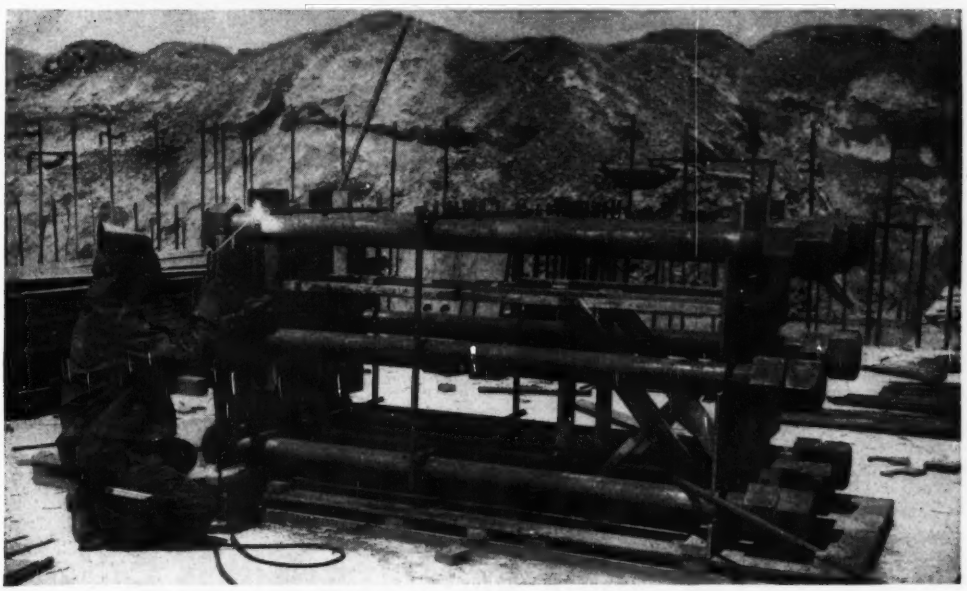
For Aluminum Company of Canada, P. E. Radley is manager; J. S. Kendrick and Franklin T. Matthias are assistant managers; H. C. Jenkinson is chief resident engineer for all projects and Karl Roestad is resident engineer at Kemano.

A. O. Strandberg is project manager for Morrison-Knudsen. Other M-K key men include Russell H. Madsen and V. A. Roberts, assistant project managers; W. J. Naef, administrative engineer; E. N. Benson, business manager; C. E. Elliott, controller; and R. E. (Whitey) Davis, general tunnel superintendent.

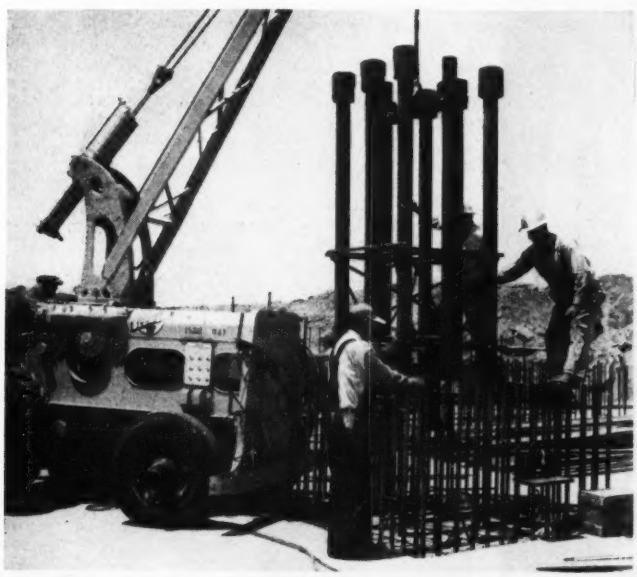
★ ★ ★

NEXT MONTH: Tunnel, powerhouse and penstock excavation, all underground.

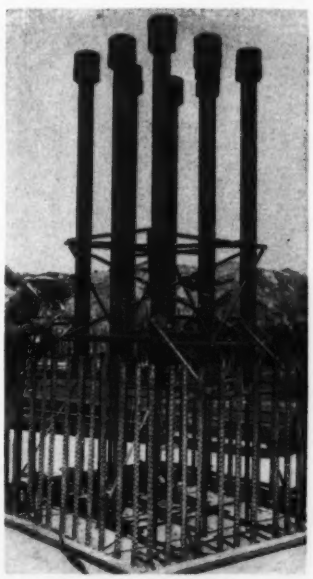
Caged Anchor Bolts Make Setting Easy



CAGING by Bechtel Corporation, engineers and contractors for the new steam plant for Pacific Gas & Electric Co. at Pittsburg, Calif., simplifies setting groups of eight 4¾-in. anchor bolts, 8 ft long, for foundations in the main boiler house by welding them into rigid assemblies with reinforcing rod ties over wooden templates so they can be easily handled, then . . .



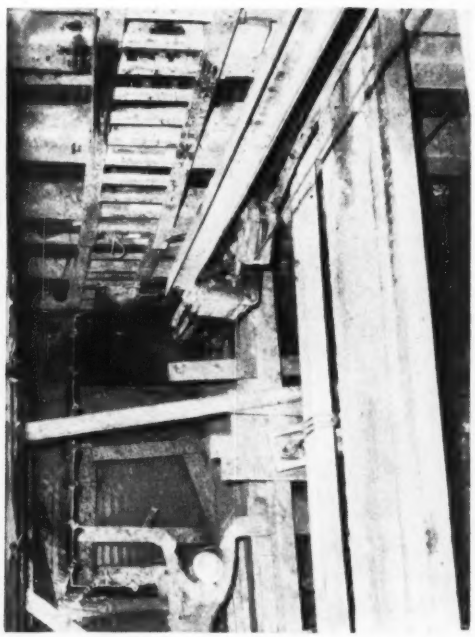
HOISTING the welded assembly with a Cardwell hydraulic crane on to supporting grid prepared in advance by welding additional reinforcing rods into nest of dowels at each anchor location, then . . .



TYING and bracing anchor bolt assembly to dowels with more reinforcing rods welded in place, ready for forms without worry about holding anchors in place. Neat, what?

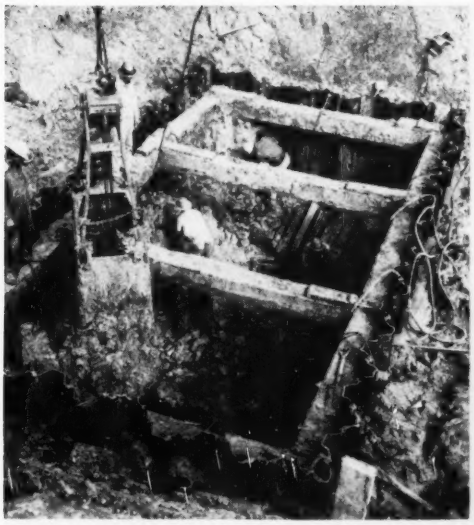
BRIDGE IS LENGTHENED at Port Arthur, Tex., so Intracoastal Waterway can be widened. When new piers are completed in pits at right, existing abutment and short approach span will be removed and replaced with steel girders decked with precast concrete slabs. Use of precast decking meant that contractors Farnsworth & Chambers had to close bridge to traffic for only ten days.

Piles Within Cofferdam Within Cofferdam



SHEETPILE IS DRIVEN by hammer riding hanging H-beam leads. When sheet falls at interfering bracing, it is cut up to fit under strut. These pieces are welded to, and driven with, next sheet.

SHEETPILE IS PULLED from wall of temporary cofferdam after pier completion. Seven parts of line between pile extractor and pulling leg give extra power for yanking long sheets with crane.



COFFERDAM IS EXCAVATED by clamshell after MP-116 steel sheetpiling is driven. Picks and pneumatic spades help move sticky clay from under bracing, whose struts will be steel at lower levels.

SHEETPILE IS LOWERED inside temporary cofferdam to be driven below floor and act as part of pier foundation. These MP-101 piles are 35 ft long; cofferdam is 65 ft deep (45 below water).

Support Bridge Piers

TIMBER PILES and a surrounding cell of steel sheeting—which itself was driven inside a temporary sheetpile cofferdam — support the piers for a bridge extension at Port Arthur, Tex. And, despite the fact that the cofferdam bottom was 65 ft below ground surface, sheets for the interior cell were driven 35 ft farther down without removal or shifting of the interfering cross-bracing.

Crossing the Intracoastal Canal, the bridge had to be lengthened in preparation for a proposed widening of the waterway. Material through which its two new piers were put down was primarily clay and quicksand and, of course, the canal was right alongside.

General construction procedure was first to excavate original ground down to just below pier-top elevation. Then, 60-ft sheets of MP-116 deep-arch interlocking steel piling were driven with a McKiernan-Terry 10-B-3 hammer to form a rectangular 15x28-ft temporary cofferdam. This was clammed out, and braced every 4 ft with an inner ring of 14x14-in. oak timbers. Two transverse 12-in. steel I-beams across the short dimension completed each bracing set. Final bottom of the cofferdam was 65 ft below original ground and 45 ft below water level.

Inside the hole, 35-ft lengths of MP-101 straight interlocking steel sheeting were driven with a 9-B-3 hammer to make a second rectangular cofferdam. But this one, 9x22 ft in plan, was to remain in place permanently: along with 17 untreated timber 35-ft piles driven within it later, it would support the pier.

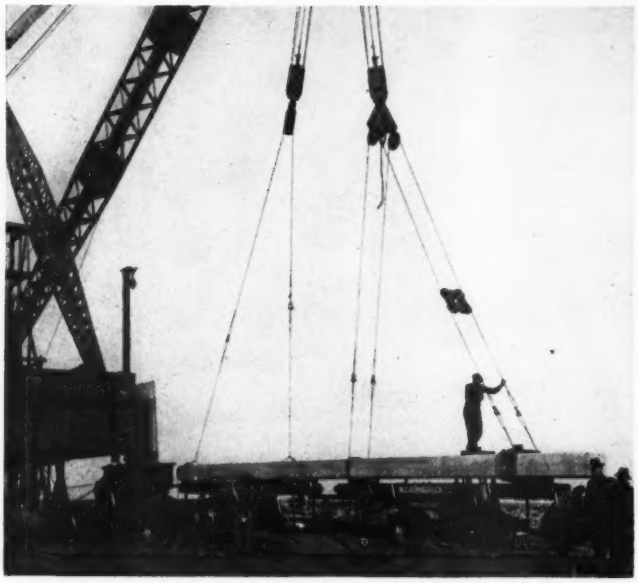
The temporary cofferdam's I-beam bracing struts were not disturbed in driving this permanent sheeting. Instead sheets which fell directly beneath a strut were cut into 4-ft sections so they would fit under the lowest bracing set. A section was welded to the interlock of the adjacent full sheetpile, which was then driven down 4 ft, carrying the short length with it. Another section was welded into the sheet under the strut, and the procedure repeated until the full 35 ft of sheeting was driven.

After the permanent sheeting and wood piles were all down, a 12x25x4-ft thick concrete foundation mat was poured on them. Above the top of mat, the pier itself was 44 ft high, 20 ft wide, and tapered in thickness from 5¼ ft at the base to 2½ ft at the top. It was surmounted by a 3½x23x3-ft deep cap.

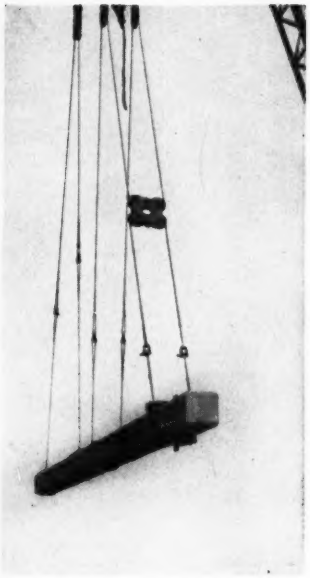
Pier forms were 2-in. tongue-and-groove lumber made up into 4x10-ft panels with 2x6-in. studs and walers. Where a cofferdam bracing beam extended through a pour, it was boxed out 6 in. at the form face and the rest concreted in. The projecting beam ends were burned off later and the holes filled.

When pier concrete and cofferdam backfill were completed, temporary cofferdam sheeting was salvaged. The pulling rig was a Marion 1½-yd crane handling a Vulcan pile extractor and a braced 45-ft I-beam pole. Hauling on a seven-part line, the crane had a 6,000-lb water tank installed as an additional counterweight.

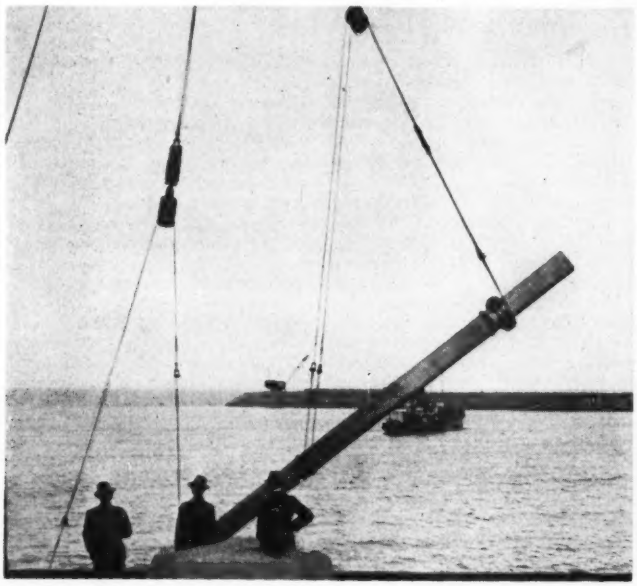
Design and construction of the bridge extension was under the supervision of the Galveston District, Corps of Engineers, for whom Glen F. Egan was resident. General contractor for the $257,000 job was Farnsworth & Chambers Co., Inc., Houston. Project manager and job engineer were, respectively, R. G. Foster, Jr., and D. R. Messer. Houston's L. B. Foster Co. furnished all permanent and temporary steel sheetpiling, the latter on a rental basis.



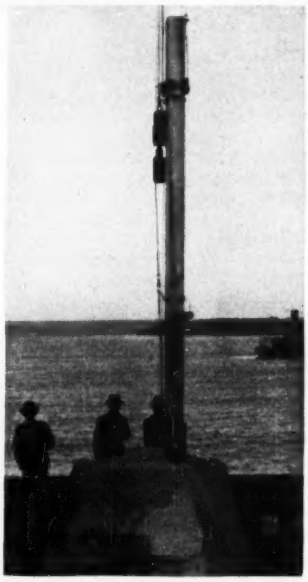
1 FOUR-POINT HITCH is fitted to long 20-in. concrete pile to place it for driving on Australian pier job. Equalizing tackle includes free-running slings and floating sheaves, plus swiveled sheaves at boom tip and main falls for perfect fleet angle.



2 FLOATING SHEAVES between upper slings equalize load on each side of pile and also space lines to fit bracelet's throats.

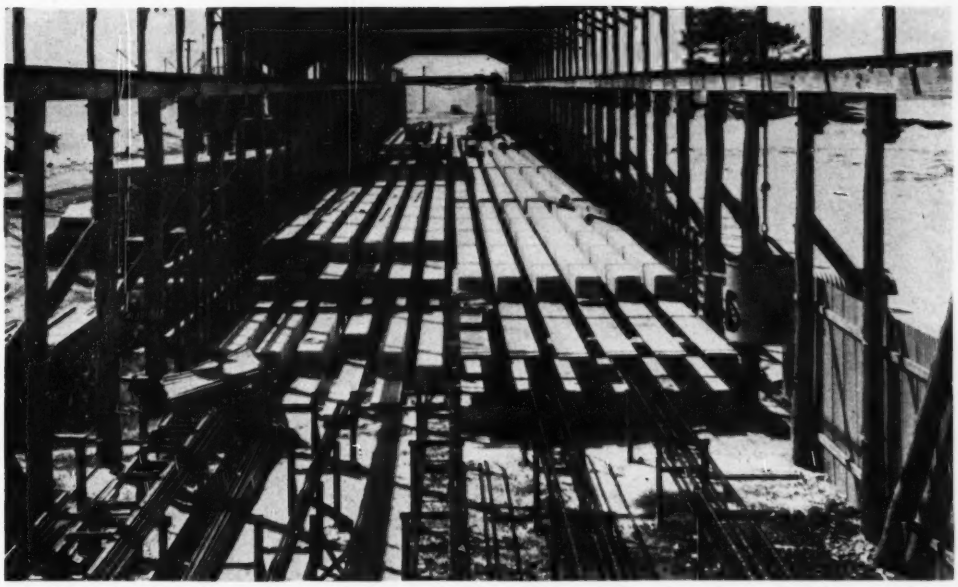


3 FREE-RUNNING SLINGS let derrick swing pile tip downward without putting unequal stresses in member as lower tackle is slacked off. As pile rotates further, lines from second double hitch will automatically fall into throats of bracelet at pile head.



4 BRACELET FITTING holds equalized line at each corner of pile, which hangs perfectly plumb. Lower single sling is slack.

Novel Rigging Swings Pile Plumb



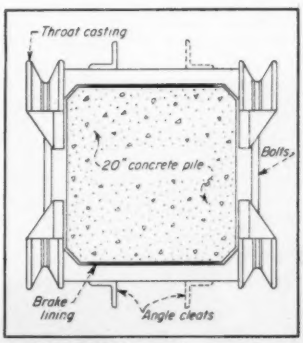
CASTING YARD 1/4 mi from pier site is fitted with bridge cranes to handle concrete, reinforcing and piles. Mixing plant is at left, halfway down the shed. In foreground is steel yard where pile reinforcing is butt welded, sawed to length and assembled.

TO SWING long, heavy concrete piles from a horizontal to an exactly vertical position for driving, an Australian contractor has devised a four-point suspension that makes the operation easy. The main feature is a special fitting, or bracelet, bolted around the pile near its head. It works in conjunction with an arrangement of floating sheaves and single and double equalizing slings; these last falling automatically into throats at each corner of the fitting as the pile is rotated. Thus, finally, the pile is suspended from an equalized line at each corner, and hangs perfectly plumb. It can then be threaded into open-top skid-type leads, where angle cleats on the fitting continue to help hold the pile plumb and in exact position during driving.

The rigging and fitting were worked out by M. R. Hornibrook Pty., Ltd., for one of its pier jobs at Mackay, Queensland. Reached by a 690-ft rock-fill approach, the 138x766-ft pier is supported by exactly 1,001 concrete piles. These are in 77 bents on 10-ft centers, with 13 piles spaced 11 ft apart in each bent. Piles are 20 in. square and have pointed tips. They are reinforced by four 1⅝-in. bars; weigh about 400 lb per running ft.

The pier deck is 13 ft above high water, tide range is a discouraging 22 ft, and berths alongside were to be dredged subsequently to 33 ft below low water. All these factors conspired to make it necessary to drive piles from 60 to 90 ft long.

Because the pier site is in the center of a cyclone zone and lay exposed to the fury of the Pacific Ocean (pending breakwater completion), it was not practicable to use floating equipment. Accordingly, the pier was built by two 20-ton stiffleg derricks with 90-ft booms, all mounted on a common traveling base. One of the steam-powered derricks handled pile driving while the other placed steel bracing and timber girders and decking. The double machine worked its way out along the pier as it was completed.



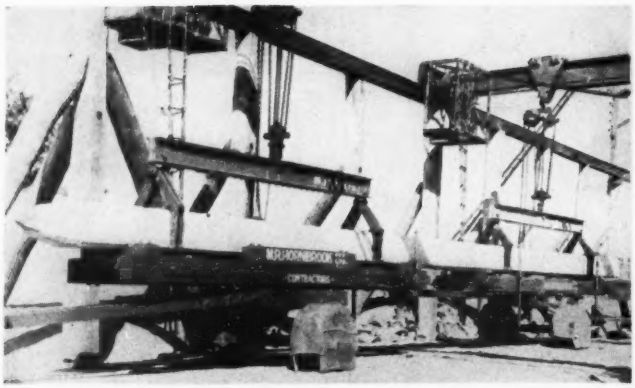
BRACELET DETAILS are shown in schematic sketch. Eight throat castings, like quadrants of small sheaves, hold lifting slings in place; four bolts clamp the fitting to the pile; brake lining prevents it slipping.

Cast in a yard at the job, piles were delivered to the driver on a pair of trailer dollies, the pile itself acting as the pole. There the bracelet fitting was bolted on.

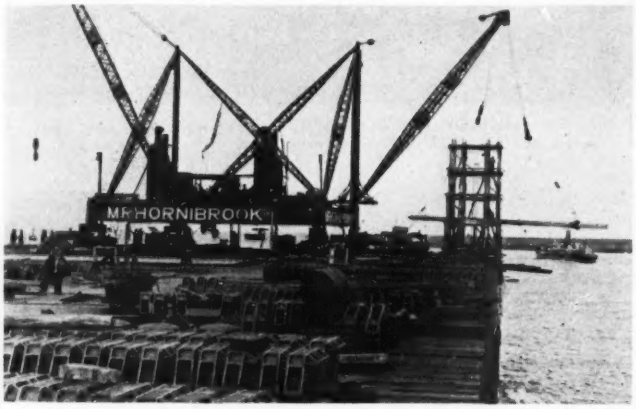
As shown in an accompanying sketch, the fitting contains eight grooved sections resembling quadrants of small sheaves and designed to fit the lifting slings. There is one of these throat castings at each corner of the bracelet. The latter is clamped around the pile by four bolts, and kept from slipping by strips of brake lining fastened to the fitting.

The equalized four-point suspension used in conjunction with the bracelet was unusual. The lower two lift points were hitched by a single sling running free over a sheave swiveled to one of the derrick's two main falls. The upper two lift points were hitched with lines on either side of the pile. Connected by a floating-sheave assembly, these lines ran free over sheaves swiveled to the second set of falls. Thus there was an equal load at each end of each line.

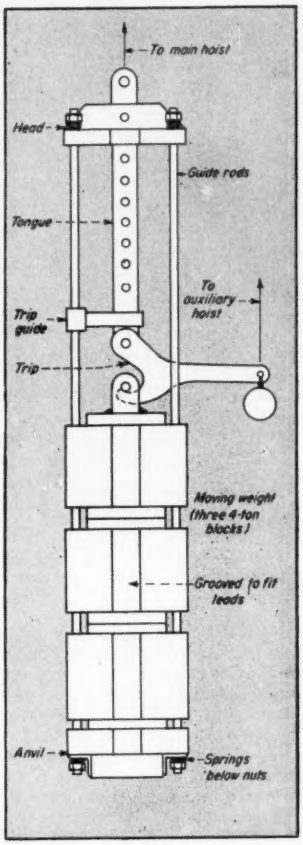
For handling a pile, the two top



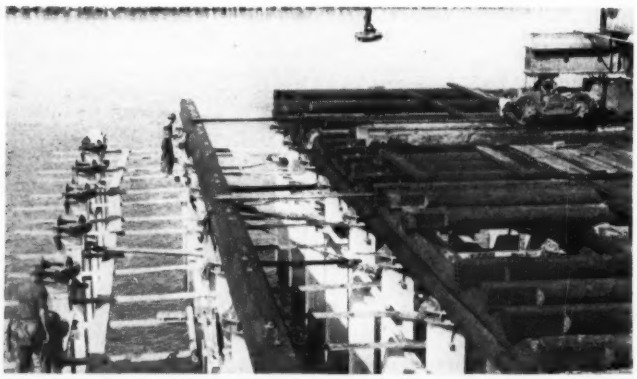
BRIDGE CRANES, which travel electrically but hoist manually, load piles on to trailer dollies for delivery to pile driver. Four scissors clamps from two lifting beams grip pile for hoisting. Canvas hoods protect dollies' tires from fierce sun when not moving.



DOUBLE DERRICKS on one traveler handle pier construction. Here, one rig sets pile cap, while other prepares to upend pile and set it in driving frame. In foreground are stored cast-iron caps and collars to join piles, steel bracing and timber deck structure.



SPECIAL DROP HAMMER has 12-ton weight falling 3 ft. Operated at 12 blows per min, it drove six or seven piles per 8-hr day.

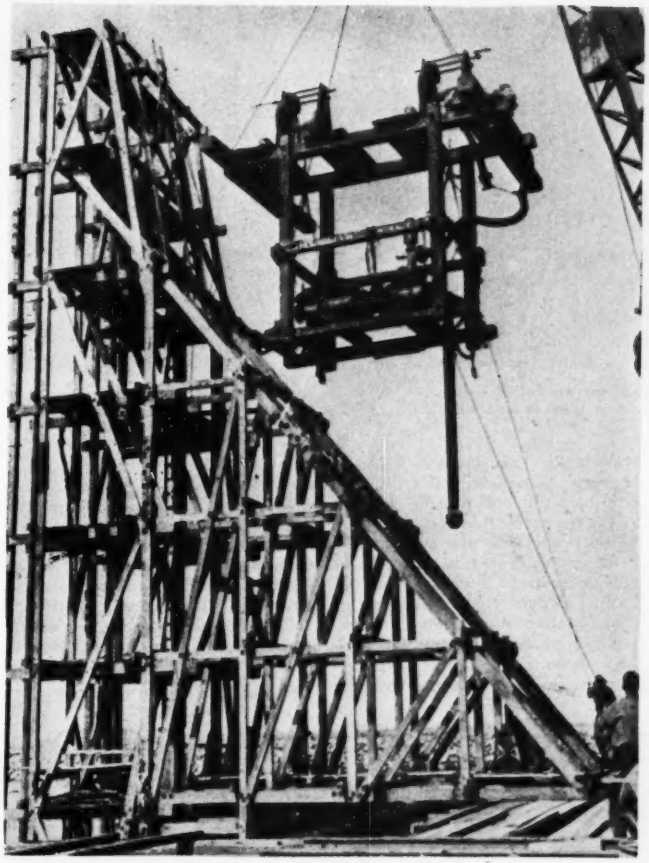


TIMBER SUPERSTRUCTURE is placed as soon as piles are down and capped, so traveler can advance to drive next bent. To facilitate deck construction, piles are driven to exact grade. The log-like timber headstocks and girders are only dressed where necessary.

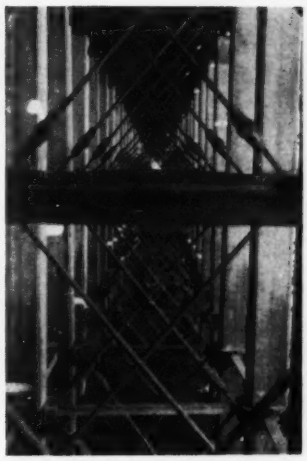
lines first were placed in the bracelet throats. The next two lines fell into their own throats as the pile came vertical. The tackle never failed to act automatically and perfectly. The single lowest sling finished below water but was quickly freed by a manila tail rope.

The exactly vertical pile could then be lifted right over and lowered into open-top pile-driving leads. Angle-iron cleats on the bracelet held it in position there. Where this procedure was not practicable, the cleats could be removed and replaced after the pile had been swung into the leads from the front.

Designed for a 35-ton loading, piles were jetted through 20 to 30 ft of sand and a thin band of gravel, then driven 10 ft into a stiff clay. Early in the job, pre-jetting with



PILE-DRIVING FRAME cantilevers over end of pier and can hold two piles on 11-ft centers. It is shifted by derrick, as is jet-pump frame being moved here. Latter also rests on pier deck and pump is raised or lowered by hand winches to follow 22-ft tides.



PIER BRACING of tie rods and angles is continuous transversely. Longitudinal bracing consists of four-panel groups at intervals.

PILE CAP is placed by derrick with lifting rail. Casting is fitted with clevis for tie rod; bolted side for timber replacement.

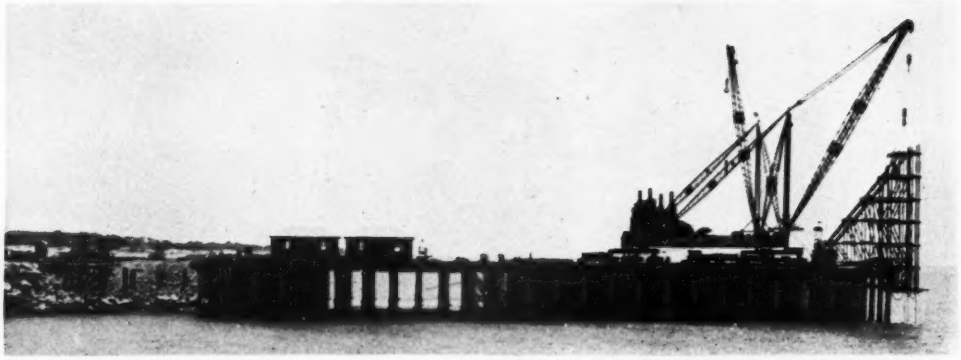
one 6-in. pipe was attempted, but with little success. Two 2-in. pipes nozzled to 1-in. worked well, however, with air sometimes fed into them to maintain circulation all the way up the pile. Jet pipes were 50 ft long, supplied with water at 100 psi by steam-operated piston pump.

Piles were driven with a 12-ton drop hammer falling 3 ft. Final penetration was usually $\frac{1}{8}$ in. per blow, but the main criterion was to have the pile head fetch up at the exact plan elevation to facilitate bracing and deck construction.

The contractor devised a special hammer for the job because it was thought that an ordinary 12-ton weight could not be dropped free by the derrick without serious wracking of its boom. The hammer (sketch) was fitted with an anvil block that sat on the pile, whose head was cushioned by 1-in. insulation board made of sugar cane fiber. The anvil carried four rods that acted as guides for the moving weight and as supports for the hammer head. Through the head moved a tongue that could be pinned to it. At the bottom of the tongue was a trip that picked the moving weight. Anvil, head and weight were grooved to fit the leads.

Here's how the hammer was worked. The main hoist line from the derrick lifted the weight by the tongue. A man inserted a pin to hold tongue to head, and the derrick operator slacked off the line. A second operator then tripped the weight with another hoist line. While this procedure sounds slow and crude, actually the three men involved became so adept that about 12 blows per minute were maintained. And the job was finished before manufacture of a contractor-designed automatic device was completed. Job progress averaged six to seven piles per 8-hr shift, jetted and driven to 40-ft penetration.

Most of the pile heads finished unblemished. Any spalling was traced to a head not being cast perfectly square or to a pile moving off plumb in jetting. Steering the pile with the jets required great skill, as often it dropped 6 ft in an instant. Accuracy of pile driving is indicated by the fact that more than half the 6x6-in. angles used for wales were fabricated to plan dimension. The great majority of



STURDY PIER, here about 25% complete, is built out into Pacific Ocean by a double derrick traveler that started from shore on the temporary timber pile structure at far left. A permanent 690-ft rock-fill approach is now being brought out around this.

the rest were within plus or minus 1 in.

Bracing and decking were kept apace of piledriving. Cast-iron collars bolted around the piles served to anchor horizontal wales and diagonal tie rods; cast-iron caps supported the deck structure. This last was of timber, mostly ironbark, a splendid Eucalypt hardwood locally available. The pile caps were designed to take double transverse headstocks. Eyebolts through headstock and cap were held by a pin-bolt passing through the eyes and through the pile. Usually a cored hole sufficed because the piles had been driven to exact elevation. Then, longitudinal 15-in. girders were placed and planked over to complete the deck.

The pier was built for the Mackay Harbour Board, H. G. Jenkinson, engineer. Contractor for the work was M. R. Hornibrook Pty., Ltd., of Newstead, Brisbane, Australia, for whom G. O. Boulton is chief engineer and W. G. Huggins is mechanical engineer. Contractor's resident engineer was A. N. McIntyre, who supplied information and illustrations for this article. Mr. McIntyre is now senior construction engineer with the Irrigation & Water Supply Commission of Queensland.

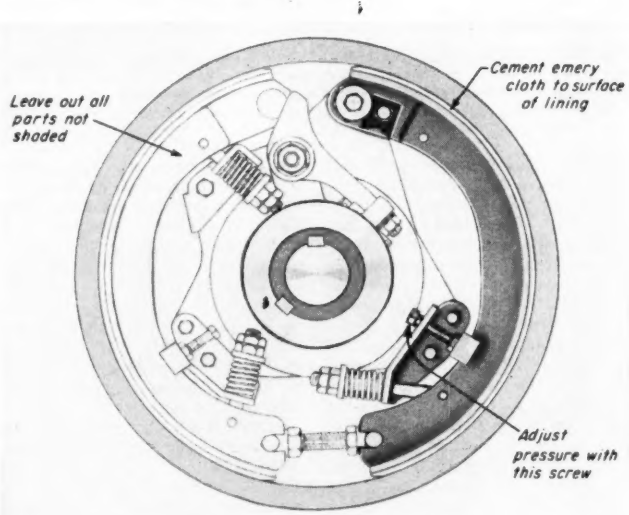
How to Correct Moderate Scoring

SCORED BRAKE and clutch drum surfaces, when viewed under a magnifying glass, show tiny sharp teeth that bring on overheating and premature wear. Drum surfaces become scored when linings are worn badly exposing rivets or band; by dragging friction surfaces; through use of improper lining; or by applying brake "dope" to lining.

The Harnischfeger Corp. suggests an inexpensive way to correct moderate scoring without removing the drum. On shoe-type clutches, remove both shoes and cement emery cloth, face out, on the lining of one shoe.

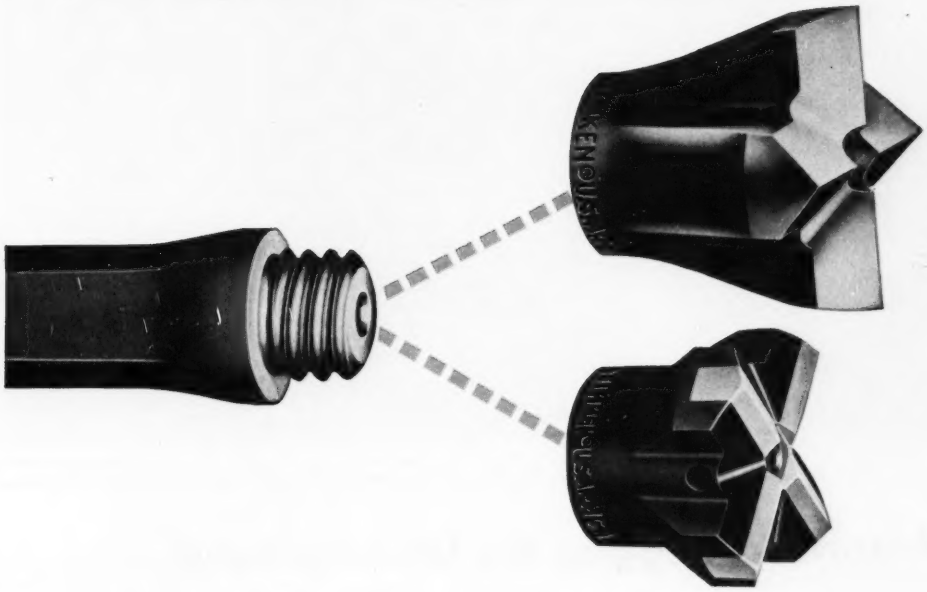
Replace this shoe on the secondary side of the machanism, as shown in the sketch and adjust the clearance so that the emery surface maintains a slight drag.

Apply a small amount of oil to the clutch surface, and let the engine rotate the shoe. Keep the surface moist with oil to retain cuttings on the drum surface—where they aid the polishing process.



MODERATE DRUM SCORING can be removed easily with a strip of emery cloth on one hand, explains Harnischfeger. Apply only a light grinding pressure and be sure bushings are good, or resultant drum surface will be uneven. Turn badly scored drums in a lathe.

USE THE SAME STEEL FOR BOTH ROCK BITS!



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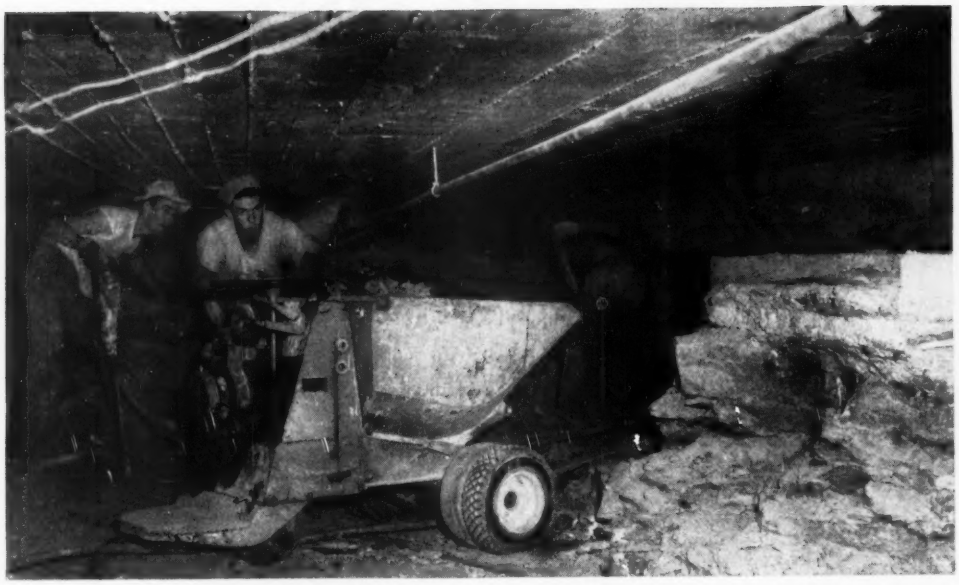
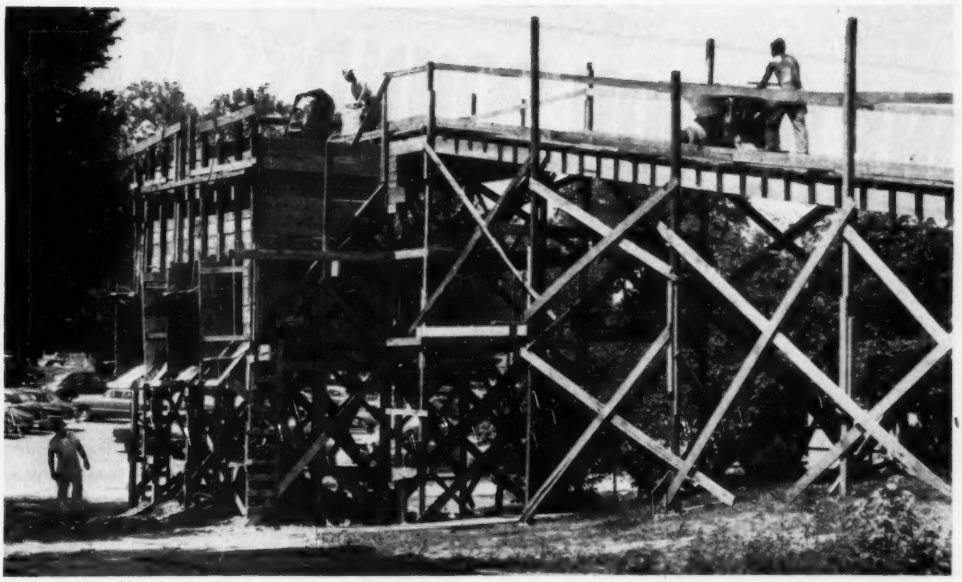


AT THE FACE, motorized buggy is loaded by hand with rock and dirt excavated from beneath terrace of Kentucky State Capitol, Frankfort, to make crawl space. Rock at right supports center of beam, later will be scaled vertical and encased with concrete.

Motorized Buggies Go Underground...

ON THE HAUL, which varies from 400 to 1,000 ft, buggy carrying 10 cu ft of muck leaves the crawl space on its way to tipple. This entry, one of two to headings beneath terrace, was made by removing steps and sidewalk. Note that rock is right at surface.

...to Handle Excavation Beneath Terrace



UP THE TIPPLE, buggies travel 20-deg ramp to dump into 30-ton bin. Kwik-Mix Moto-Bugs handled 2,000 yd of earth, 1,000 yd of rock and 500 yd of brick rubbish on this job. Frankfort is a dirt-short town, so truckers hauled from tipple without charge.

DIGGING A SHALLOW CRAWL SPACE under an existing terrace slab at the Kentucky State Capitol in Frankfort could have been a nasty operation — 3,000 cu yd of earth and rock had to be mined out, and final headroom was only 4 ft. But Struck Construction Co., contractor for general repair and modernization of the old structure, also was building a new Capitol Annex near by. On this job, all material was handled by motorized buggies riding a series of wide timber ramps (CM&E June 1951, page 48). So the contractor simply took the buggies, some of the ramps, a few masonry saws and the men, and moved across the street and went underground. The buggies handled all spoil, the ramps served as a tipple, and fans from the saws furnished ventilating air.

The terrace, which forms a 25- to 50-ft wide concourse around the Capitol, extended 175 ft on two sides and 500 ft on the others. It was of reinforced concrete beam and slab construction topped with paving brick. In general, original ground under the terrace had not been excavated except to allow construction of the concrete forms, and these had been left in place as there was no room for stripping.

Over the years, much water had leaked through the terrace. Reinforcing steel was exposed and rusted in both slabs and beams, while the concrete had spalled and disintegrated in many places. Stalactites as large as 2x12 in. hung from the underside wherever water had penetrated the slab. Drainage under the terrace had gone to pot, along with water piping to hose cocks and electrical conduits to lights.

By W. J. POUCHOT, Superintendent
Struck Construction Co.

To restore the underside of the terrace concrete with gunite and to renew plumbing and electrical work, a 4-ft crawl space was excavated below. Above, the 4-in. brick paving was removed and replaced by a 2½-in. lightweight fill topped with 1½-in. brick. A five-ply sealing membrane between these layers made the terrace watertight.

The mining job beneath the terrace was attacked from entries on two sides of the Capitol, with fresh air boosted along to the working faces by fans dismounted from Clipper masonry saws. Of the 3,000 cu yd of excavation, one-third was solid rock. This was drilled with Ingersoll-Rand Jackhamers and blasted with 60% dynamite with a series of five du Pont delays. Usual loading was one-half stick per hole. Shots were protected with Anchor rope blasting mats and heavy timbers, but caution had to be taken to avoid pulling rock from under the beams' intermediate footings. Cleco scaling hammers and Thor busters took care of trimming and secondary breaking of chunks too large for handling.

Because of limited headroom, the blasted rock had to be hand-mucked. And the 2,000 yd of earth, which was dug with Thor air spades, also had to be handled in this manner. There was enough room for motorized buggies to operate in the crawl space, however, so Kwik-Mix Moto-Bugs were brought in to haul all spoil. After being shoveled full at the face, these 10-cu ft units ran outside and up a 20-deg timber ramp where they dumped into a 30-ton elevated bin for truck loading.

At the beginning of the job, each heading was served by two operators and three Moto-Bugs—an operator would leave an empty unit at the face and pick up a loaded one for delivery to the tipple. As hauling distance increased, each crew was enlarged to three operators and five buggies. Round-trip haul varied from a minimum of 400 ft to a maximum of 1,000. The

(Continued on page 62)

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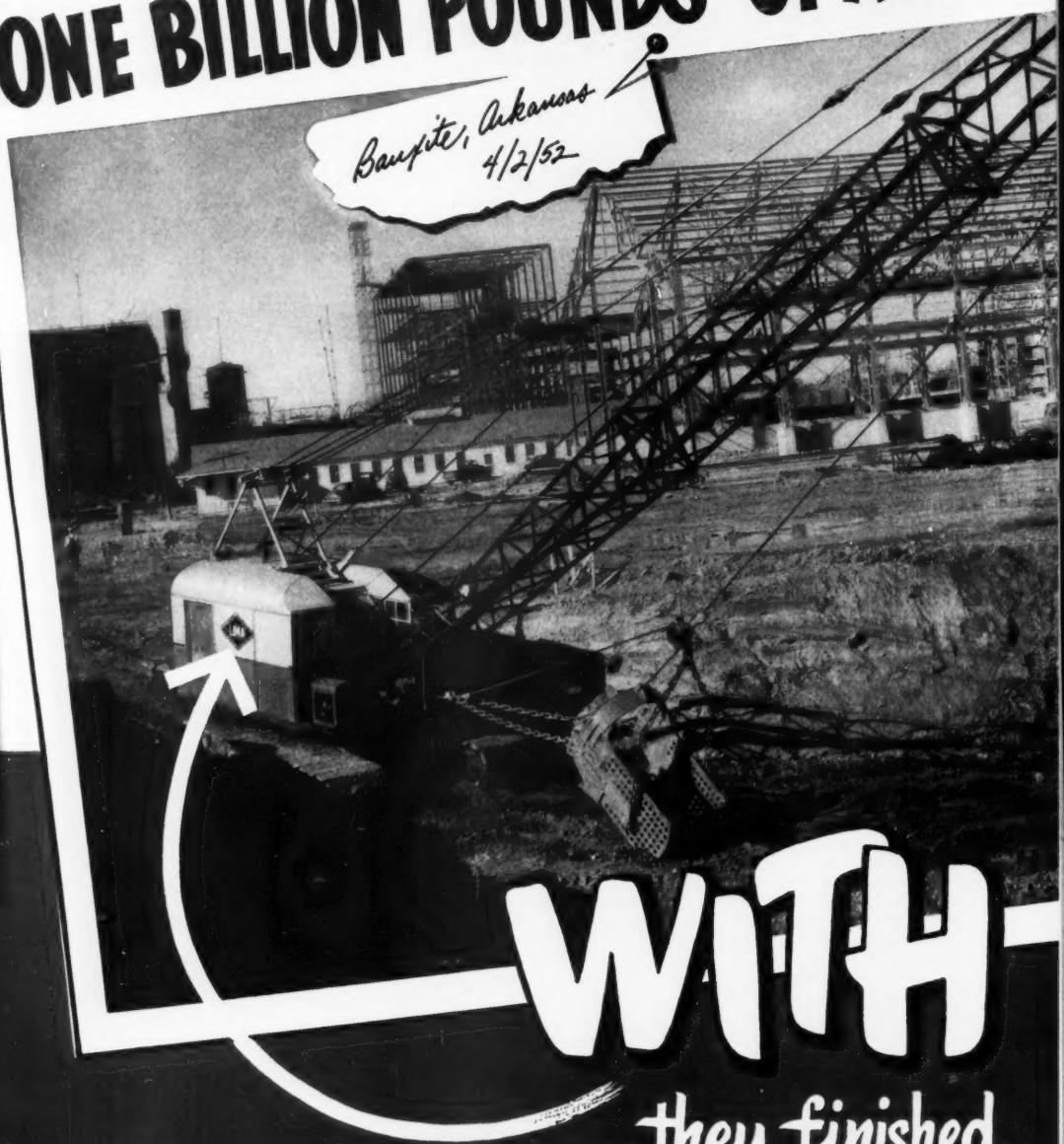

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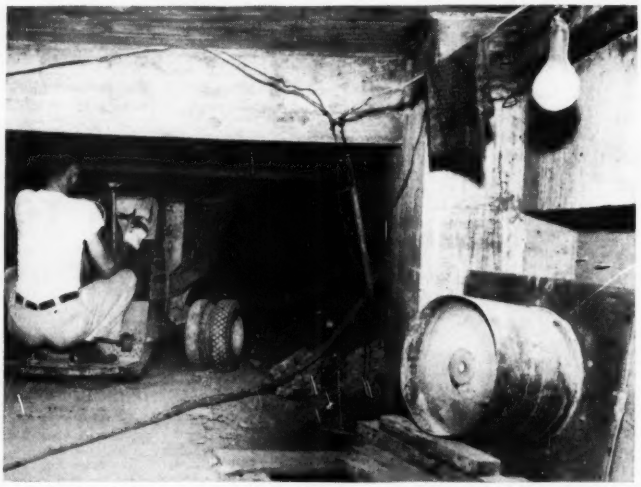
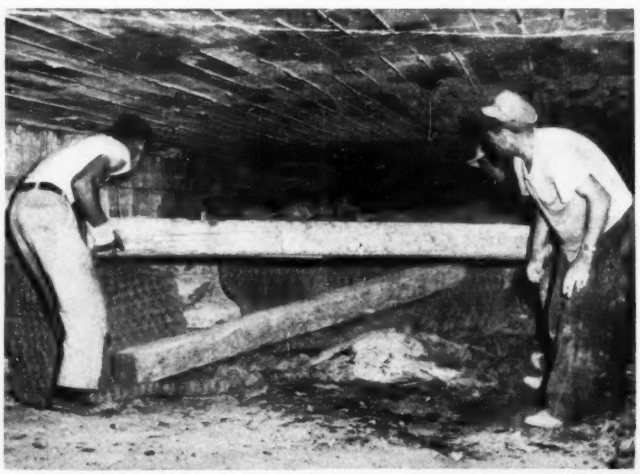


IN THE HEADING, vertical clearance under beams is small, but Moto-Bug and acrobatic operator skin through without trouble. Fan (right) taken from Clipper masonry saw pushes fresh air to working face. Two similar units exhaust stale air through holes in slab.

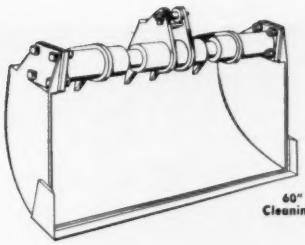
Moto-Bugs and tipple also took care of some 500 cu yd of rubbish incident to paving removal.

The entire operation moved smoothly and very cheaply. With the motorized buggies, there were no installation or removal costs, as with belts or track-operated equipment. Haul road maintenance was small. If a machine broke down, it was simply removed for repair and a replacement unit sent in. Thus the job was not tied up—or even slowed appreciably by a breakdown. And this method of handling spoil with motorized buggies should pay off on many other mining operations where the gathering of small amounts of material from irregular drifts for dispatch outside often presents a problem.

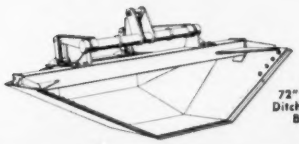
Architects for the restoration and modernization of the 45-yr-old Kentucky State Capitol were Oberwarth & Livingston, of Frankfort. Porter White, of Lexington, was consulting engineer. General contractor for the job was Louisville's Struck Construction Co., for whom the author was job superintendent.



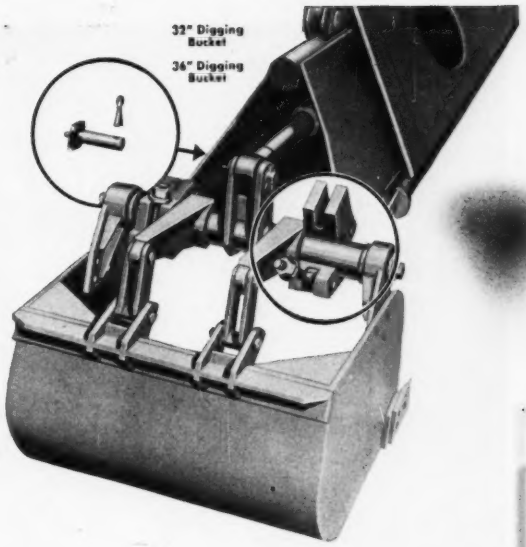
UNDER THE TERRACE, rope protective mats and timber cover are placed before firing blast in rock. Holes are lightly loaded, of course. Slab forms, originally left in place, have been pretty well wrecked out during excavation, but beam forms are still in place (left).



60" Ditch Cleaning Bucket



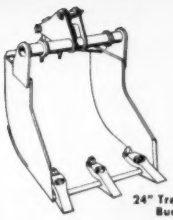
72" Formed Ditch Digging Bucket



32" Digging Bucket

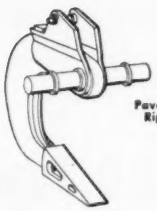
36" Digging Bucket

In less time than smoking a cigarette ...your GRADALL is a "new" machine

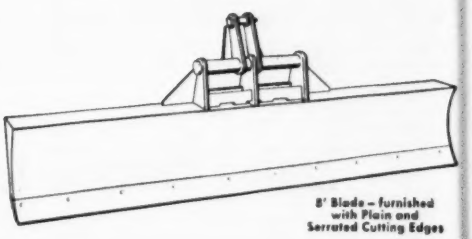


24" Trenching Bucket

15" Self-cleaning Bucket for Wall Footings



Pavement Ripper



8' Blade – furnished with Plain and Serrated Cutting Edges

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Shown are some of the wide variety of tools for the many specialized jobs performed by the Gradall. All can be carried right on the Gradall. And because they can be quickly interchanged, in a matter of minutes you can have a "new" machine for the job at hand—whether it's trenching, excavating, pavement removal, ditch cleaning, grading, or backfilling.

If your construction involves various types of jobs, this should give a good idea of how the Gradall can cut costs for you. Ask your Gradall Distributor for a field demonstration.

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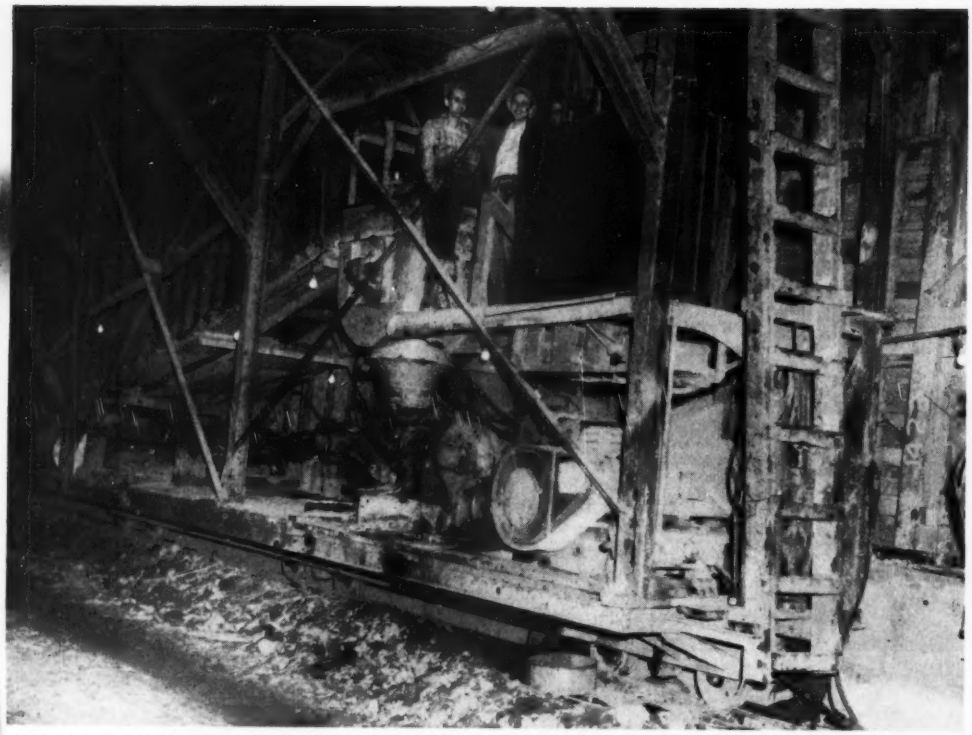
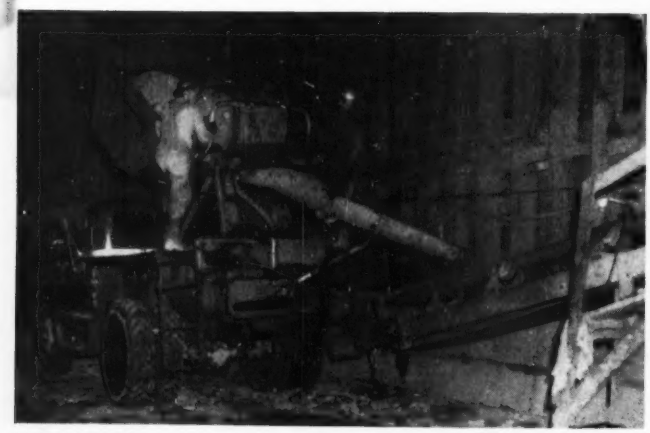


ARCH AND SIDEWALL concrete for big double-track B&O R.R. tunnel at Clarksburg, W. Va., is placed by Rex 200 double Pumpcrete fed by belt conveyor. Pumpcrete is mounted on side of jumbo riding arch form rails. Arch form is out of view at right.

B&O R.R. photos

Lining Pumped for B&O Tunnel No. 1



MIXED CONCRETE is hauled from central plant outside tunnel to 30-in. belt charging Pumpcrete hopper by 4-yd Maxon Dumpcretes mounted on high frame on Hendrickson diesel trucks. High frame permits discharge directly on to feeder belt.

DRIVING the Baltimore & Ohio R.R. Tunnel No. 1 at Clarksburg, W. Va., through an abandoned coal mine was one of the toughest tunneling jobs on record (CM&E, September 1951, page 60). Bates & Rogers Construction Corp., Chicago, and the B&O engineers rapidly forgot their excavation struggles as the concrete lining followed in orderly, efficient manner with Pumpcrete placement.

The new double-track tunnel, opening up a troublesome single-track bottleneck between Washington and St. Louis, is 3,236 ft long. Placement of 22-in. concrete lining inside of steel posts and arch ribs brings the inside clearance down to 31 ft wide and 28 ft high, above top of rail, with semicircular roof.

At bottom of sidewalls is a ballast wall and drainage curb. These,

(Continued on page 66)

Pennsylvania contractors prefer DAVEY Compressors!

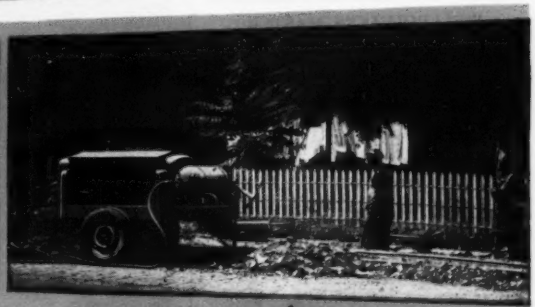
In Pennsylvania, as in other states, leading contractors rely on Davey Compressors for all types of construction and maintenance work.

Every Davey Compressor is equipped with Permanent Peak Efficiency lifetime valves. These never carbon or foul . . . do not require cleaning or replacement . . . keep tools operating at full capacity.

A-4009

Davey Model 315 Diesel in service of D. Dinardo, Inc., on Banksville Circle Job, Penn-Pitt Parkway, near Pittsburgh.

1



2

3

1 Davey Model 105 on Pittsburgh housing project.

2 Crafty Construction Co., uses Davey 105 on Turtle Creek, Pa. sewer job.

3 Another Davey 105 used by Crafty Construction Co. on Penn Township job.

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Foundations: Hendrickson Bros.

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DEEP POWER PLANT CUT

DEEPEST SUBGRADE on this job was 23 ft below Manhasset Bay (see photo) and 29 ft below spring-fed ground water table. Underlying soil was sharp sand with a 6 ft overburden of very plastic clay. Maximum stability of excavation was mandatory to safeguard adjacent Power Plant and highway.

• Operating frequently in "Wellpoint Country," this heavy construction contractor encounters many wet jobs and has learned from repeated experiences how helpful Griffin engineers can be. Dry, stable working conditions were achieved quickly and economically in spite of high head and tricky working conditions.

• When a wet job calls for know-how, call for Griffin.

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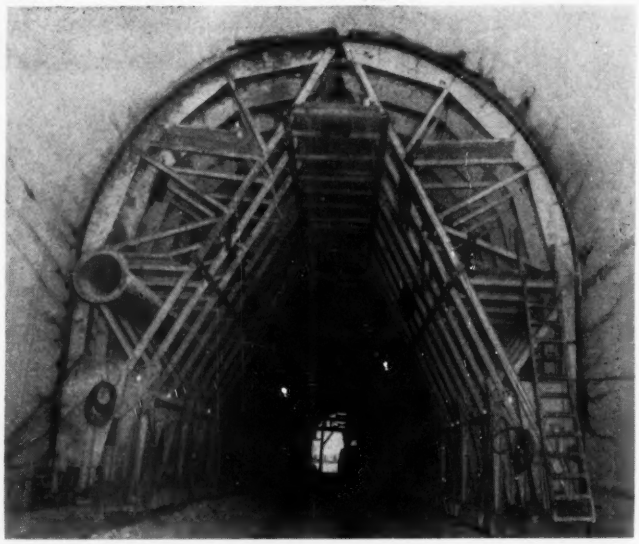
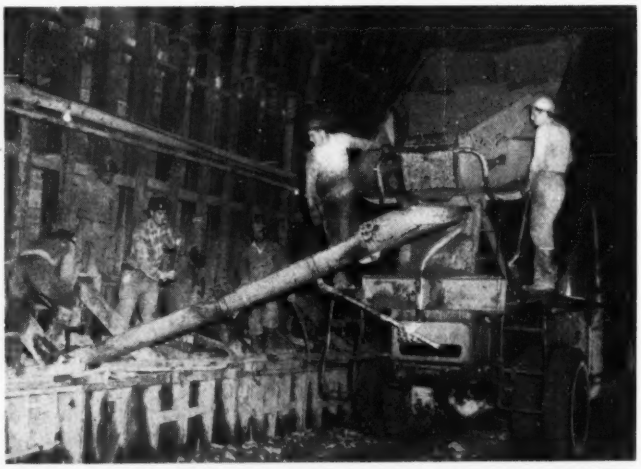
PUMP TUNNEL LINING . . . Continued from page 64



NON-TELESCOPING arch and sidewall form rides rails set just inside ballast walls. Blaw-Knox form 30 ft long is moved ahead 18 hr after completion of pour. Beyond form is jumbo with Pumpcrete and conveyor mounted on right side. Concrete discharge pipe enters form at top center of far end. Concreting started before tunnel was holed through, accounts for vent pipe section at left and wide center clearance for muck and concrete trucks.



BALLAST AND CURB FORMS were filled directly from Dumpcrete trucks by short chutes. These walls were kept well ahead of arch pours. Note extra high frames for Dumpcrete body mounting to give additional discharge clearance.

along with base of sidewall, were poured ahead of the sidewalls and arch. Walls and roof followed in one pour within 30-ft Blaw-Knox forms at the rate of 35 cu yd per hr.

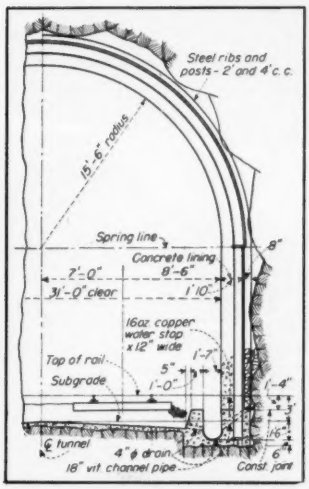
The concreting procedure was simple, but highly effective. Aggregates were dumped from gondola cars into a pit, thence loaded by a Hough Payloader into a hopper feeding belt conveyors and elevators that charged a Butler batching plant. Bulk cement was delivered to the batch plant by another elevator. Concrete was mixed by a 2-yd Smith tilting mixer.

Mixed concrete was delivered from the plant to the forms in three 4-yd Maxon Dumpcretes mounted on special high-framed Hendrickson diesel trucks for high discharge

clearance. The Dumpcretes discharged directly into ballast and curb forms through short chutes.

The Rex 200 double Pumpcrete machine that placed sidewall and arch lining was mounted on the side of a jumbo riding the form rails. Also mounted on the same jumbo was a 30-in. belt conveyor, 50 ft long, that transferred mixed concrete from the dump trucks to the Pumpcrete agitator hopper. The pump discharge pipe looped over the jumbo to enter the arch form at center of crown, extending to back of form at start of pour.

As a pour was started, the end of discharge pipe was moved from side to side of top center to fill evenly the back haunches, then was



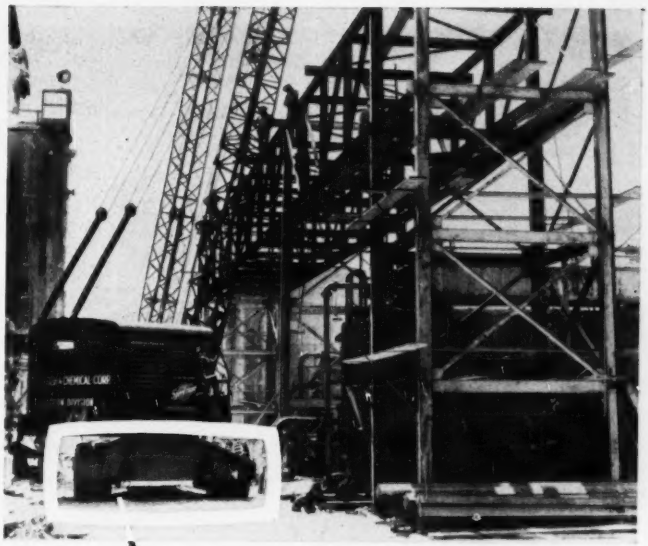
LINING BIG CROSS-SECTION of B&O Tunnel No. 1 was easy with three pours—one for lower ballast and curb walls on each side; one for both sidewalls and arch as a unit. Subgrade fill was placed after ballast walls were poured, providing good roadway for concrete truck haul.

centered as the crown began to fill. The pipe was then kept buried in concrete, slowly pulled ahead by moving the entire jumbo by a car puller, as the form filled from back to front.

Snapping of the Pumpcrete valves and chattering of the pipe warned the crews when the arch became well packed and it was time to pull the pipe ahead a little. Pumping proceeded until concrete started to leak out around the end bulkhead, indicating the form was full.

A highly plastic concrete mix

(Continued on page 70)



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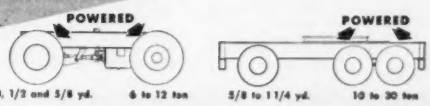

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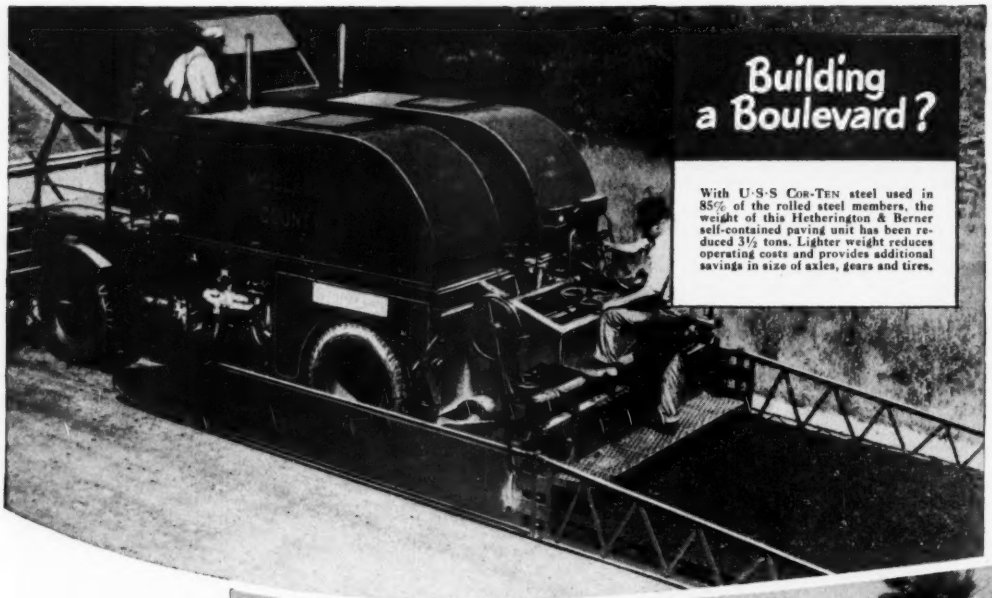
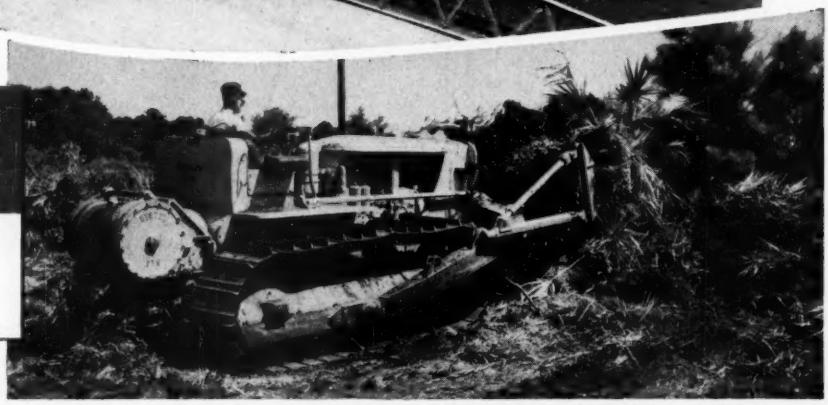


Building a Boulevard?

With U·S·S COR-TEN steel used in 85% of the rolled steel members, the weight of this Hetherington & Berner self-contained paving unit has been reduced 3½ tons. Lighter weight reduces operating costs and provides additional savings in size of axles, gears and tires.

Flattening a Forest?

U·S·S High Strength Steels have long been used to assure the dependability for which Caterpillar Tractor Co. machinery is world famous.



U·S·S COR-TEN STEEL

U·S·S COR-TEN is a ductile, low-carbon chromium-nickel-silicon-copper-phosphorus steel having a minimum yield point, in thicknesses of ½" and under, of 50,000 psi—at least one and one-half times that of structural carbon steel.

It has a minimum tensile strength of 70,000 psi in these same thicknesses. In resistance to abrasion and shock it is superior to structural carbon steel; its fatigue resistance—that is, its ability to withstand vibration stresses—is 60% greater.

What particularly distinguishes U·S·S COR-TEN steel is its unusually high resistance to atmospheric corrosion—4 to 6 times that of plain steel, 2 to 3 times that of copper steel. It is this property that assures the safety, long life and low maintenance cost of any equipment in which COR-TEN steel is used.

U·S·S COR-TEN steel is produced in all standard products—plates, shapes, bars, sheets, strip, special cold-formed sections, wire and tubular products. It is recommended particularly in light and intermediate thicknesses.

U·S·S MAN-TEN STEEL

U·S·S MAN-TEN is a grade of manganese-copper steel possessing formability, toughness and weldability in a higher degree than obtainable in carbon steel of the same strength level.

U·S·S MAN-TEN steel has the yield point and high tensile strength of 50,000 psi and 75,000 psi, respectively, in thicknesses up to ½" inclusive. Its abrasion resistance is greater than that of structural carbon steel (ASTM A7); its fatigue strength is approximately 40% higher, insuring greater resistance to the vibration and reversal of stresses to which many types of equipment are subjected.

U·S·S MAN-TEN steel is well suited for applications requiring high strength, toughness, workability and weldability together with atmospheric corrosion resistance equal to or slightly better than that of copper steel. More than 18 years of satisfactory service under the most severe conditions have established the suitability of this grade for lightweight, rugged construction.

U·S·S MAN-TEN steel is produced in plates, shapes, bars, sheets, strip, special cold-formed sections and other products. It is particularly recommended for light and intermediate thicknesses.

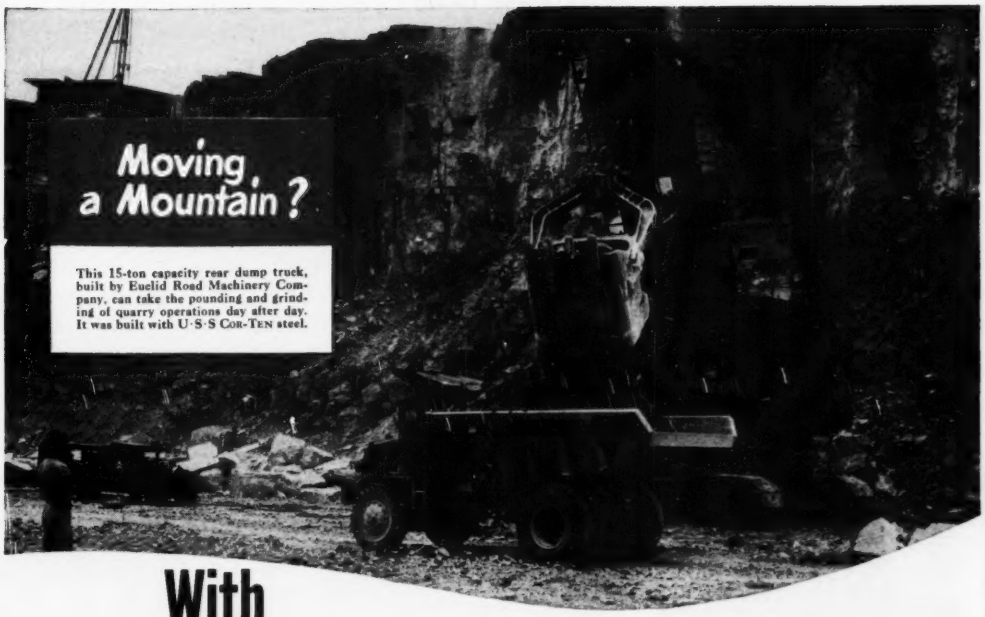
U·S·S TRI-TEN* STEEL

This manganese-nickel-copper steel has a yield point of 50,000 psi min. and a tensile strength of 70,000 psi min. in thicknesses of ½" and under, with moderately lower values as thickness increases to a maximum of 4". It has greater resistance to abrasion than structural carbon steel (ASTM A7) and its fatigue resistance is 50% higher. It also has superior toughness and ability to withstand shock at sub-zero temperatures. U·S·S TRI-TEN steel's resistance to atmospheric corrosion is superior to that of copper steel.

Because U·S·S TRI-TEN steel has very good welding properties in intermediate and heavy thicknesses, this grade is particularly recommended for application in heavy-duty equipment, such as illustrated above, where maximum ruggedness and strength with minimum weight are prime requisites.

U·S·S TRI-TEN steel is produced in plates, structural shapes, bars and bar shapes.

** During the present critical shortage of nickel, an emergency manganese-copper-vanadium grade, identified as U·S·S TRI-TEN "E" steel is being produced in place of U·S·S TRI-TEN steel. It has equivalent engineering values and its use is recommended in place of U·S·S TRI-TEN steel.*


Moving a Mountain?
This 15-ton capacity rear dump truck, built by Euclid Road Machinery Company, can take the pounding and grinding of quarry operations day after day. It was built with U·S·S COR-TEN steel.

With U·S·S High Strength Steels your equipment can take it!

NO matter what the job, these famous "steels that do more" give your equipment the ruggedness, the durability to keep going day after day, month after month.

With equipment built of U·S·S COR-TEN, U·S·S MAN-TEN, and U·S·S TRI-TEN steels instead of carbon steel you have fewer time-wasting breakdowns. Maintenance costs drop and bills for replacements are far lower. You save money and you do the job better and quicker.

That, in a nutshell, is the story of U·S·S HIGH STRENGTH STEELS as they are used in construction and earth-moving equipment.

These high strength steels have a yield point 50% higher than ordinary structural steel and afford high resistance to fatigue, abrasion and impact. For equipment which must operate in sub-zero temperatures, or under corrosive conditions, high resistance to these destructive forces can readily be obtained by using these steels.

You can use COR-TEN, MAN-TEN and TRI-TEN steels to build maximum strength and toughness in vital parts ordinarily prone to fail. With them you can materially increase the strength of parts *without* increasing their weight. Or you can use these steels in lighter sections and reduce weight without reducing strength or stamina. In the latter case a substantial saving in steel will result.

Contact our nearest office and let us show you exactly how you can apply U·S·S HIGH STRENGTH STEELS to make your equipment last longer. For 18 years our engineers have cooperated with manufacturers of the best construction equipment in applying these steels.

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Amazingly effective. Thoroughly breaks up and removes heavy, slippery ice and snow formations. Replaces all types of snow plow blades or maintenance units. Write for Bulletin and name of nearest Distributor.
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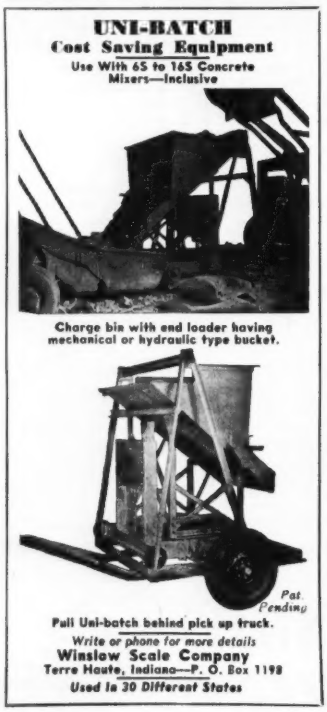
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Used In 30 Different States

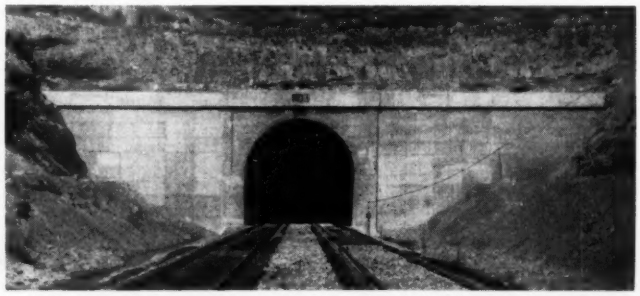
PUMP TUNNEL LINING . . . Continued from page 67

ALL CONCRETE WAS MIXED at this Butler plant outside of east portal. Hough 1-yd Payloader loads aggregates from rail pit into belt conveyor hopper for transfer to top of plant. Bulk cement is handled through bin at right. Dumpcrete trucks receive mix from 2-yd Smith tilting mixer.

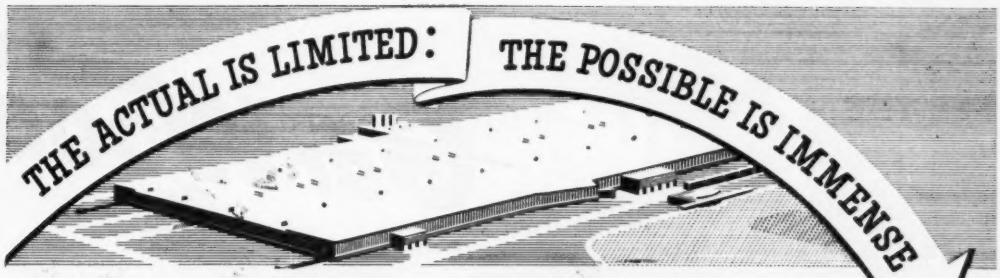
was made up of 7.2 bags of cement and 3½ lb of Master Builders Pozzolith per yd. Forms were stripped 18 hr after completion of pour and no curing of finished concrete was required.

The construction of this project was under the direction of A. C. Clarke, chief engineer; with general supervision by W. W. Gwathmey, Jr., engineer of construction; J. W. Jones and C. L. Kroll, regional engineers; and design by C. E. Sloan, engineer of bridges, all of Baltimore, Md. G. E. Norris, resident engineer; and J. W. Packman, project engineer, both of Clarksburg, were in charge in the field.

For Bates & Rogers Construction Corp., Chicago, John W. Rogers, vice-president, was in general charge. M. C. Warmbier was general superintendent, and Carter Fore was shift superintendent. Vic Short was manager and Larry Wesley is master mechanic.



HIGHBALL! Completed Tunnel No. 1 removes bad single-track bottleneck on B&O main line 3 mi east of Clarksburg, W. Va. No sign here of that troublesome old coal mine inside of mountain that made driving so difficult.



NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

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WELDED DESIGN SIMPLIFIES CONSTRUCTION ...SPEEDS FABRICATION, CUTS ERECTION TIME

SHOWN below are typical examples of how welded design cuts building costs. Continuous framing and elimination of splice plates save substantial tonnage of steel. Efficient shop fabrication is achieved with fast, downhand welding techniques. Simple beam-to-column details speed field welding with resulting cost savings of 15% to 20%.

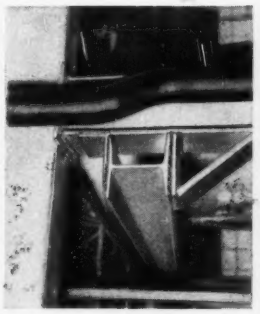

Fig. 3. Simple details cut costs 23% *on factory building. 500 ton framework is set and welded by 5 man crew in 70 days. Fabricating and erecting costs are $150 per ton. Supplied by $195 fabricating. Contractors, Repp & Mundt, Inc. Columbus, Ind.*

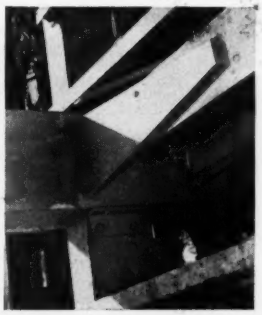

Fig. 4. Continuous girder *passes over column and is spliced at point of minimum stress. Typical detail is from multi-story 1700 ton framework that requires 15% less steel. Structural designing, Paul E. Jeffers and Robert Wilder, Los Angeles, California.*

Fig. 5. Beam to column connection *on 11 story department. 1200 ton framework erected with 25% less steel. Field welds are made in fast, downhand position to cut erection time. Engineers and Contractors, Byrne Organization, Inc., Washington, D. C.*

WELDED DESIGN ALWAYS SAVES STEEL AND LOWERS COST

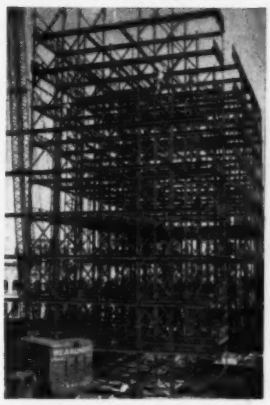

Fig. 1. Cuts steel 25% *on 13 story Ridpath Hotel, Spokane, Washington. Cost of all-welded design 900-ton framework is 20% less than riveting. Architect, Ned L. Abrams, Sunnyvale, California.*

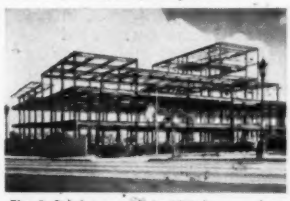

Fig. 2. Steel tonnage is 15% less *on four story department store for J. W. Robinson Department Stores, Los Angeles, California. 6" less height per story results from welded design. Architects, Pereira and Luckman and Charles O. Matcham.*

HERE'S HOW

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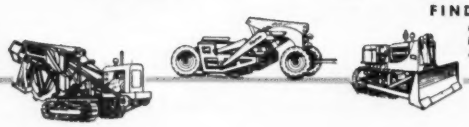

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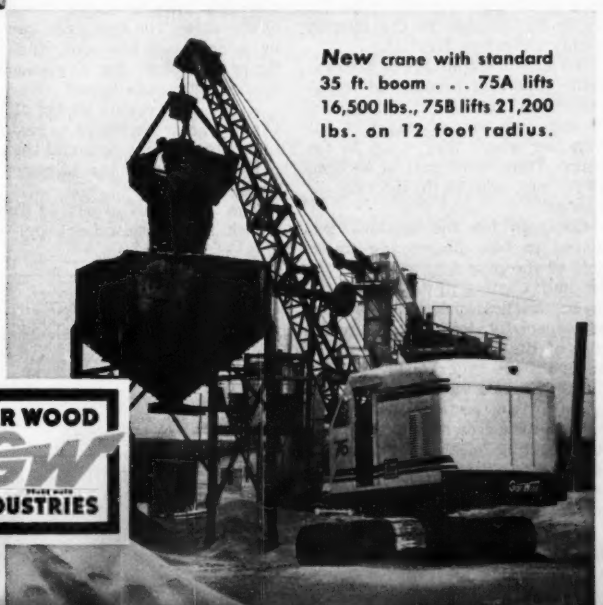
All models are easily convertible *in the field* for shovel, lift crane, clam, dragline, magnet, trench-hoe and pile driver work. *Only* Gar Wood offers the new Foundation Borer, an attachment that opens an entirely new source of profit to power excavator operators. A few Gar Wood features are listed below. Check your Gar Wood shovel distributor for full information.

and TRUCK CRANES



New crane with standard 35 ft. boom . . . 75A lifts 16,500 lbs., 75B lifts 21,200 lbs. on 12 foot radius.

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Collapsible Inner Form Simplifies

INVERT HALF OF PIPE is cast first—in place in the trench. Reinforcement wires are set up around core form in open U shape, wood falsework defines rough outer shape.

WAY DOWN YONDER in Australia, the State Rivers and Water Supply Commission of Victoria uses reinforced concrete pipe for water distribution in the Murray Valley Irrigation District.

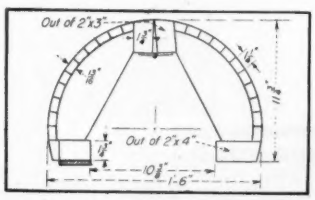
Because of a shortage of factory-made pipe and because of transportation difficulties, it was decided to cast pipe sections right in the trenches where they were to remain. They were cast in sections 16 ft. long and 18 in. internal diameter.

Concrete for the sections was placed in two pours: the invert half of the pipe first and then the top half. Casting in the trench was made practical primarily because of a specially designed collapsible core of timber construction which made up the inner form.

The core is divided longitudinally into two sections which are joined at the crown by butt hinges. A retracting mechanism attaches to the core at the center and near each end. It expands the form to correct width when setting up for pouring, and contracts it for removal. The retracting assemblies are moved in or out by a ¾-in. threaded spindle along the base of the core. The spindle is turned by a crank at one end, and the thrust is taken by a stationary block at the opposite end.

As the core covers an arc of 180 deg only, it is necessary to cast the invert of the pipe first and then to place the core on top to pour the upper half.

The lower half is poured in the trench after longitudinal and cir-



CROSS-SECTION SKETCH shows dimensions and arrangement of materials (mostly wood) used.

Pipe-Casting in Trenches

COLLAPSIBLE INNER CORE forms are of simple construction, readily installed and removed.

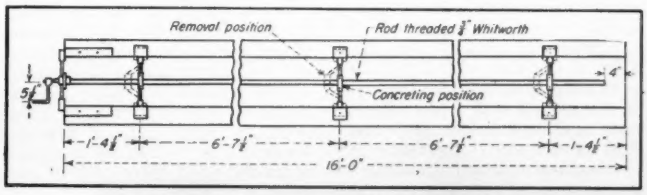
READY FOR THE TRENCH is the semicircular timber expansion form. It is 16 ft long and will create an inside dia of 18 in. Same form is used for halves of pipe.

cumferential reinforcement wires have been set up, the latter in open U-shape. Wooden falsework along the walls of the trench not only holds the reinforcement in position but, together with the bottom of the trench, defines the outer configuration of the trough-shaped pipe half. The inner cross-section is imparted by the semi-circular core placed inside.

After the invert half of the pipe has been poured, the seam section is screeded off and the core is contracted and lifted out.

It is then again extended and placed on top of the invert, resting just inside it. The open reinforcing wires are bent to circular shape over the core and tied or welded together, and the top half of the pipe is now built up. No outer form is used in this operation, but a semihexagonal shape is produced by screeding.

The core is extracted through the accessible end of the pipe after contraction and is set up in an adjoining section of the trench for pouring of the next invert.



SMALL CRANK at one end of the threaded steel spindle is turned to actuate assemblies that expand form into concreting position and after pouring, for removal from the finished pipe. No outer form is used. Reinforcing wires form rough shape.

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IT'S PROFITABLE
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Clean Sand and Gravel need not cut your job-profits! Get them at LOWEST COST and get them CLEAN with Reliance Units—strong, simple, rugged, greatly improved for today's faster operation. With Reliance Units you can build exactly the right plant to meet your requirements, and it can be easily moved anywhere. Let us tell you more about Reliance Advantages—*write for Catalog 48.*

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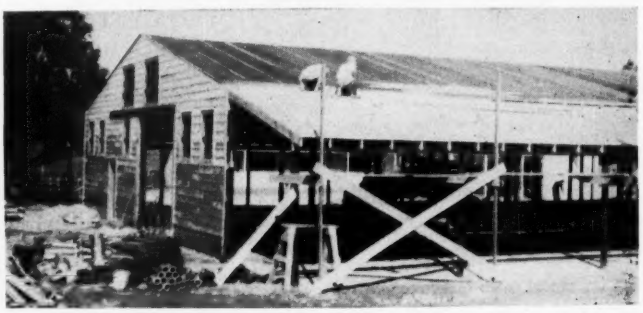
Here's an Idea for a Simple Shop, Warehouse or Barn

LOOK AT THOSE nice clean spans you get by using creosoted poles stuck 4 ft into the ground for columns in shops or warehouses. Roof framing is nailed, no bolts are needed. Put down your floor (asphalt is fine) after you close in the structure.



MAIN BUILDING is 26-ft center span with 13-ft side spans. Additional 13-ft spans can be added as lean-tos if desired. Keep longitudinal spacing of poles at 13 ft for easy framing.

Photos by Courtesy of American Wood Preservers' Assn.

IT STARTED with a barn built near Mt. Kisco, N. Y., but here's an idea that looks promising for contractor shops or warehouses or field offices.

You don't need foundations or footings, no excavation. But here's a structure 78x104 ft in plan that can be put up in a hurry; and it will last this job and the next, and many more, if you don't want to tear it down.

Simply get yourself some Class 7 A. S. A. 8-lb creosote-treated pine poles 25 ft long. Set them 4 ft in the ground with a 26-ft center-span spacing and two 13-ft spacings on each side of the center bay —that gives you the 78-ft width. Of course, you can cut out some of the side spans if you don't need them. Set the poles 13 ft apart in longitudinal spacing for as far as you want to go, if 104 ft doesn't meet your needs.

The roof is framed with timber girts carried on scabs nailed to the poles, so there is no end bearing on the pole columns. All framing can be nailed, so you don't need any bolts. Nailed siding will close in the sides and ends. And you can put down an asphalt floor.

Ralph Mann, of the American Wood Preservers Association passed the idea on to us. He points out that the structure saves steel, can be erected in a hurry over a bulldozed site, and can be used over and over again, if desired. He says, too, you can get this class of treated poles today without any trouble.

There also is a strong trend in farm building design toward the

(Continued on page 78)

GENERALS combine Safety and Strength

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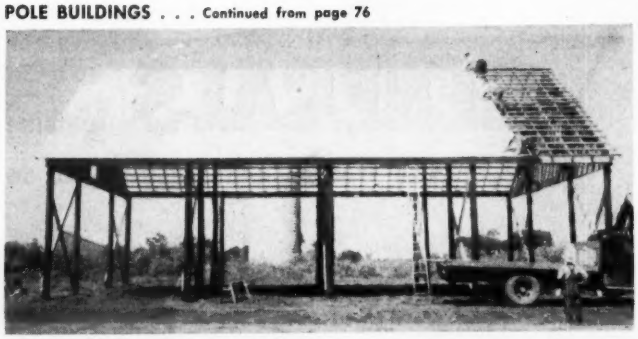
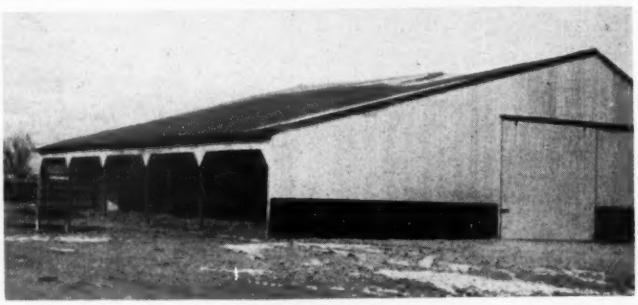


HAY STORAGE SHELTER under construction on the Peddicord Ranch, Wamego, Kan. Measures 56x44 ft, holds 240 tons of baled hay. Requires ten 20-ft and ten 25-ft poles with 7-in. tops.

STOCK PAVILION, one of three identical 96x24-ft units erected for the 4-H Club of Jefferson County, Kansas. Built on 12-ft and 16-ft pressure-creosoted poles with 6-in. tops.



BEEF FEEDING BARN measuring 75x52 ft. Cattle feed in open portion, hay is stored in closed portion at right. Pressure-treated splash boards run along base of building.

AUGER AND BOOM on tractor dig holes and install treated poles for Normandy Construction Service, Inc., Normandy, Ill., who supplied this photo and one immediately above.

use of one-story service structures, framed with pressure-creosoted wood poles.

Although some farm owners do the construction work on pole barns themselves, much of it is handled by contractors who usually have a tractor or truck with an auger attachment and a powered lift boom to set the poles into the holes. This is true particularly in the mid-West where such structures are in demand for the protection and feeding of cattle and sheep. Trucking companies are erecting pole structures to house their equipment—in some cases open on one side to save the additional cost of hanging large doors.

STORAGE SHED for equipment of St. Joseph Fuel Co., St. Joseph, Mo., has open front, aluminum sheeting for sides and roof.

In general, a fairly level, well-drained site is desirable for a pole-frame building. In such cases, the earthen surface usually will pack down and suffice for a floor. Gravel or crushed rock can be added for surfacing where asphalt is not desired.

Poles 4 ft deep ordinarily are considered to have sufficient anchorage in good soils. But a 5-ft depth is preferable in loose soils to obtain suitable resistance to wind stresses.

In addition to pressure-treating the poles, it is good practice to place similarly treated splash boards in outside walls from the ground line upward to a height of 1½ to 2 ft. This protects that area against deterioration through decay and termite attacks. Sides and roofing frequently are sheets of corrugated aluminum.

STANDARD IN CONSTRUCTION MACHINERY

Leading excavator manufacturers offer Twin Disc Drives as standard equipment . . . because the digging business puts the severest tests met by any industrial machinery.

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Like the manufacturers, the users of construction machinery, too, have settled on Twin Disc as the *sure source* of drives because they are dependable, long lasting, easy to service. And furthermore, because they are backed by the most complete service—Twin Disc maintains a $3¼ million stock of parts and replacement units at 8 Factory Branches and 60 parts stations strategically located for fast service.

Twin Disc Drives are offered as standard on Lima Shovels. A Twin Disc Power Take-Off is the main engine Clutch, and two Model E Clutches (one shown) control the swing on the Lima Type 34 Paymaster Shovel.

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Backed for a Lifetime

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11,250 lb.

HD-9
72 drawbar hp.
18,800 lb.

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109 drawbar hp.
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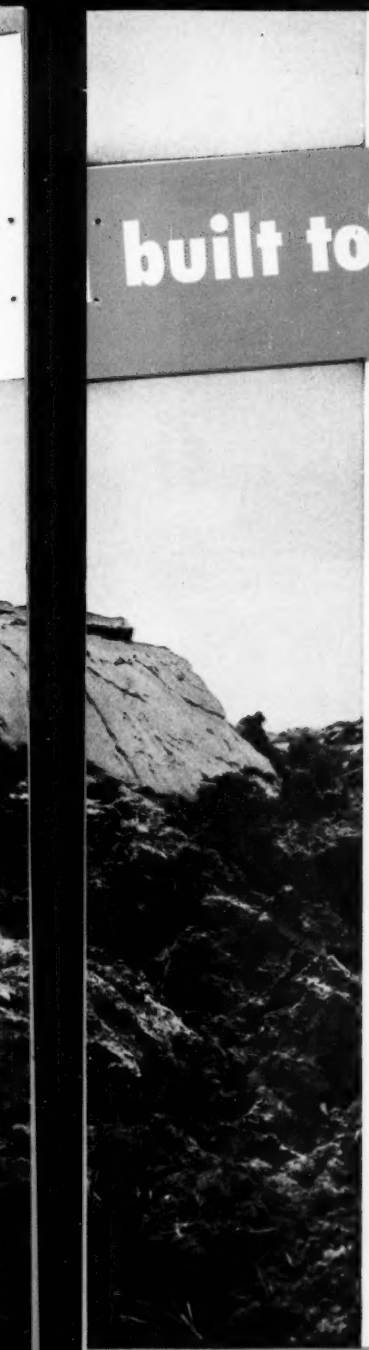

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The HD-9 and HD-15 build up greater drawbar pull faster . . . hold it longer than ever thought possible in gear transmission tractors.

For example, when tough going has pulled travel speed down 40 percent, these tractors will have increased their drawbar pull almost 20 percent over rated pull. They will lug down almost 45 percent from rated travel speed before drawbar pull even starts to fall off.

To take full advantage of this important GM 2-cycle diesel engine characteristic, the HD-9 and HD-15 have longer truck frames, lower idlers and sprockets. That means more track on the ground . . . better stability . . . sure-footed traction . . . unequalled *lugability.*

Extra Long Life

Here are a few of the many reasons why these newest, finest tractors are *built to take it.*

- **All-Steel Welded Construction**
- **More Power with Bigger Engines — Longer Engine Life**
- **More Weight, Greater Strength**
- **Extra Heavy Main Frames — No Extra Reinforcement Needed for Front-Mounted Equipment**
- **Long-Lasting, Large Diameter Clutches**
- **Double Reduction, Straddle-Mounted Final Drive Gears with Live Sprocket Shafts and Caged Bearings**
- **Positive Operating Track Release — Works in Oil**
- **All New, Specially Designed Track Assembly**
- **Positive-Seal Truck Wheels, Support Rollers and Idlers — Mounted on Tapered Roller Bearings, 1,000-Hour Lubrication!**

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DESIGNED FOR YOUR JOB · BUILT TO "TAKE IT" · EASY TO OPERATE · EASY TO SERVICE

ALLIS-CHALMERS

TRACTOR DIVISION · MILWAUKEE 1, U. S. A.

FOR NEW SUPERHIGHWAY east out of Salt Lake City on U. S. 40, Parsons & Fife Construction Co. has set up this all-portable Pioneer VE-Duplex screening and crushing plant to produce 180,000 tons of granular base material in 2½ months. It is charged (top) by bulldozer pushing bank run material off bench into hopper at end of Armco tunnel (bottom). Power is supplied by diesel-engine drive and diesel-engine generator housed in separate trailer. Plant can be dismantled into sections meeting Utah's new highway weight limits.

Neat Portable Plant Prepares Granular Base for Utah Road

By J. B. PARSONS, Parsons & Fife Construction Co.

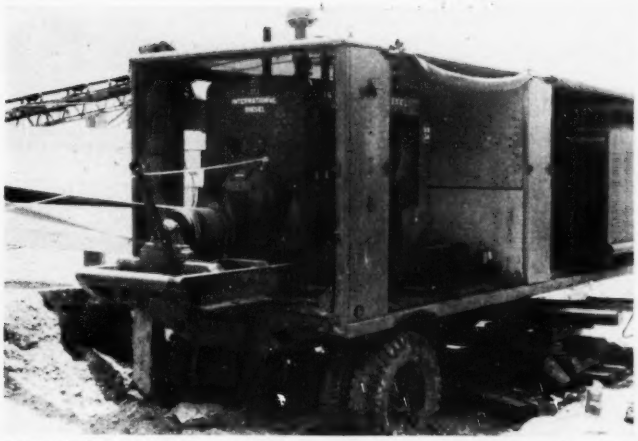
(As Told to Ray Day)

FOR CONSTRUCTION of a new $540,000 4½-mi divided superhighway between Salt Lake City and Parley's Canyon on U. S. 40, the Utah Department of Engineering specified a course of minus 1-in. granular material between subgrade and the bituminous surface.

To produce 118,000 tons of this material, including mineral filler and seal chips for the surfacing in 2½ months, Parsons & Fife Construction Co. of Brigham City, Utah, set up a fully portable pioneer VE-Duplex screen and crushing plant with an Armco tunnel and Pioneer hopper feed, all on rubber.

The new highway, all on new location, is 55 ft paved width, with

(Continued on next page)



DOUBLE POWER PLANT is mounted in its own covered trailer. Main crushing and screening plant is driven through flat belt by International UD-24 diesel engine. Electric current for lighting and conveyor motors comes from International diesel generator at far end. Trailer also houses job shop.

PAY GRAVEL flows off end of discharge conveyor into hopper for loading into one of contractor's fleet of new Ford F6 trucks, hauling 8½ tons of payload. These trucks replace larger units that can haul only 5½ tons under new road weight restrictions.

a 3-ft concrete gutter on each side. Subgrade is compacted to 90-95% density, and on top of this is placed 7 to 9 in. of the granulated base material. Surfacing is 3-in. plant-mix asphalt with a 2-in. base course and 1-in. asphaltic concrete topping.

The gravel deposit is high on a bench of ancient Lake Bonneville, south of the mouth of Parley's Canyon and about 2½ mi from one end of the job. Because of a predominance of rock greater than the 1-in. base specification and much greater than the ½-in. stone chips,

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"Complete's" patented wellpoints give you compactness, simplicity, lightness and Strength. Keep wet work bone dry when other methods fail. Write or wire for estimates, and engineering consultation. Don't Gamble with costly water hazards . . . get "COMPLETE" and get results!
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SAVE HOURS,

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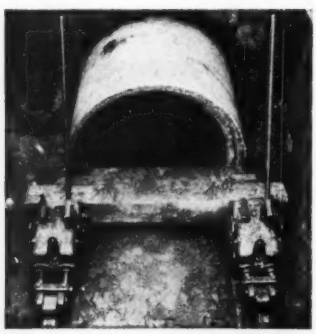
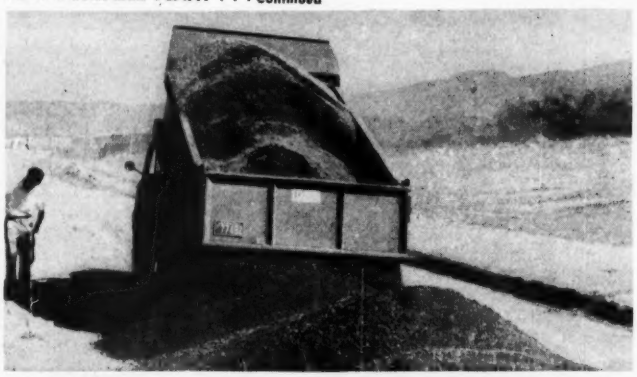
PUSH PIPE UNDER STREETS, TRACKS, walks, floors and other obstacles with a GREENLEE Hydraulic Pipe Pusher. One-man-operated, portable, simple to operate. No tearing up of pavement . . . eliminates extensive ditching, tunneling, back-filling, tamping, repaving. Cuts job time to a fraction. GREENLEE Hydraulic Pipe Pusher often pays for itself on first job. Two sizes—model shown above for pushing ¾ to 4" pipe. Larger unit, below, for pipe over 4", concrete sewer pipe and large drainage ducts. Power pump also available for extra ease and speed of operation.



GREENLEE

Write today for descriptive literature. Greenlee Tool Co., 2191 Columbia Avenue, Rockford, Illinois, U.S.A.

NEAT PORTABLE PLANT . . . Continued



TRUCKS DUMP processed base material on to subgrade for spreading and mixing by several passes of Caterpillar No. 12 graders. Final compaction of base is by pneumatic tire rollers.

the crushing ratio is well over 50%.

The simple, efficient, mobile plant setup has been developed to speed moving and to reduce the cost of mobilization. A 10-ft Armco pipe tunnel, in which the trap and Pioneer feeder are located, is wheel-mounted to be put in position with very little heavy lifting. The whole plant is permanently mounted on its own rubber and, by obtaining a special permit, it can be moved legally over the roads of Utah, Idaho and Wyoming.

An efficient part of the setup is the mounting of International UD-24 diesel engine and an International diesel electric generating set, which furnish power to drive the plant. Both engines are mounted in a large covered trailer, which also serves as a field shop. The trailer is placed easily simply by leveling off a spot with a dozer. Side thrust is taken by heavy timber shores at each corner of the trailer, facing the rock plant, to deadmen. The UD-24 drives the plant through a long flat belt.

A bulldozer charges the receiving hopper from high on the bench. Raw material is fed by the Pioneer feeder to a conveyor leading through the Armco tunnel to the plant. When the material first enters the plant, it is classified on the bottom screen deck. Acceptable material falls through and passes to storage. The remainder passes through a 10x36-in. jaw and 20x36-in. roll, in closed circuit with the screening system, and is reduced in size.

Easy adjustments make it possible to balance the crushing load between jaw and rolls when pit characteristics change. Early in the job, the simple adjustment proved its worth. Specifications for the base course material call for 1-in. maximum, with 45 to 65% passing the No. 4 screen, and 35 to 55% passing the No. 40. But the minus 200 material could not exceed 10%.

While this specification made an excellent base course material, it presented quite a problem in crushing, for, in order to produce the minus No. 4 and No. 40 material, the roll crusher clearance had to be close. With the rolls set for ½-in. clearance, enough rock dust was produced to throw the minus 200 material out of acceptable balance.

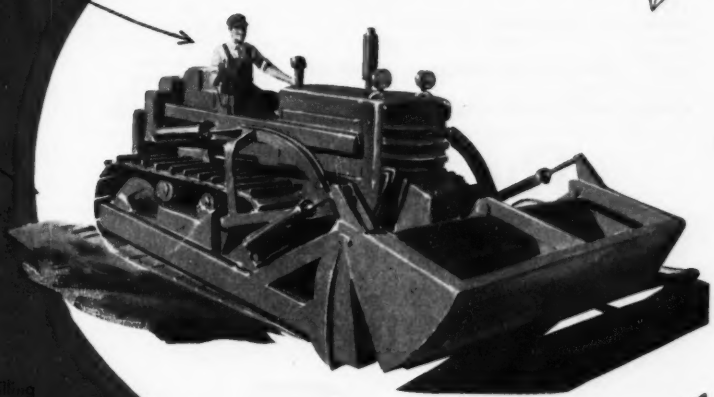
A simple adjustment, taking only a few minutes, opened the rolls to ⅝ in. and tightened the jaw slightly. This reduced the minus 200 dust and still gave the mix the minus No. 4 and 40 material it needed to make it dense and well graded. Bedded clay seams in the pit also were shoved aside with the dozer from then on.

The 46-VE Duplex plant, working in 1-in. minus material with about 52% crushing, is producing 1,750 tons per 8-hr shift. On occasion it has gone as high as 2,100 tons.

Last year, Utah, along with several other states, ordered a rigid enforcement of its 18,000-lb axle load limit. The ruling caught many contractors with fleets of large trucks, built for heavy loads. Parsons & Fife Construction Co. was no exception, and an appraisal of the weight of its trucks showed that a payload of only 5½ tons could legally be carried. Naturally, no rock plant can operate faster

(Continued on page 86)

Protection by TOUSEY!



TOUGH, sturdy refuse filling equipment is protected by TOUSEY finishes from extremes in weather, the constant battering of tin cans, broken glass and other objects, as well as corrosive acids developed by garbage. ★ Manufacturers of such equipment using both TOUSEY primer coat and finish report excellent results in durability and appearance. ★ Exacting standards for raw materials and production assure uniformity and quality in all TOUSEY products—another form of protection offered its many customers.

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20 ft. more air per minute keeps 2 big breakers hitting at top pressure, instead of weak 70 lbs., increases their production 30% to 40%.

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75 ft.
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185 ft.
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deliver 15% to 25% more air *at lowest cost per cubic foot of any compressors on the market,* to run today's tools at their full efficiency, greatly increasing your production with the same men and tools.

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Manufacturers of Pile Driving Hammers and Pile Extractors

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NEAT PORTABLE PLANT . . .

Continued from page 84

than the facilities for hauling or storing what it produces.

Study of various hauling trucks resulted in the purchase of ten Ford F6's. These are lighter trucks, but they are sturdily built and can haul an 8½-ton payload legally.

The rock base course is so well graded that placing the material is no problem. As the trucks finish dumping for a section 1,000 to 2,000 ft long, two No. 12 Caterpillar motor graders move in and road-mix the rock to eliminate any segregation. If the material is dry,

HAPPY about his efficient plant setup and good progress on the super-highway is J. B. Parsons, head of Parsons & Fife Construction Co., Brigham City, Utah.

moisture for the desired compaction is added by sprinkling.

The motor graders then begin cutting material out of the main windrow, placed at the quarter point on the highway, and drift it across the roadway. A Case tractor-drawn rubber-tire roller works with the graders, compacting the material in thin lifts. When the base is finished, it is tight-bladed to polish it smooth.

The project is financed in part by Federal Aid, and is being supervised under the general direction of D. H. Whittenburg, chairman of the Utah Department of Engineering. E. G. Johnson is chief engineer, and J. Q. Langford is construction engineer. Robert Phillips is general superintendent for the contractor.

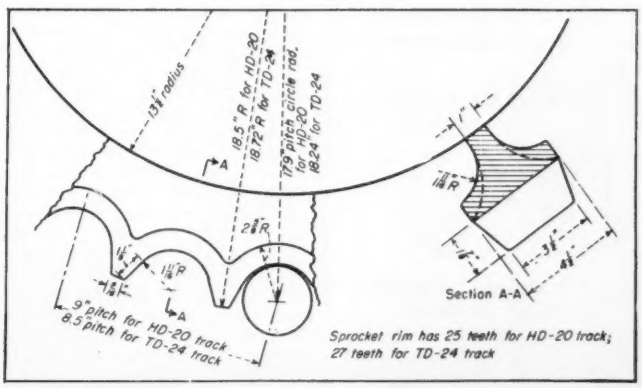
This D8 runs on TD-24 tracks, and you too can...

Adapt Your Crawler to the Tracks at Hand

A CM&E Maintenance Feature

WHAT DO YOU DO when your crawler tractor needs a new set of tracks, yet standard replacements are just not obtainable? The contractors building the Quebec North Shore & Labrador Ry. (CM&E, September, page 62) ran into that problem. And they licked it by altering the tractors of one manufacturer so that available tracks of two other makes would fit.

It all started when Cartier-McNamara - Mannix - Morrison - Knudsen couldn't get enough replacement tracks for their Caterpillar D8s: A long, wide and

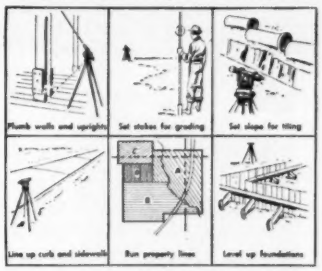

13½" radius
18.5" R for HD-20
18.72" R for TD-24
7.79" pitch circle rad. for HD-20
18.24 for TD-24
A
28" R
11" R
9" pitch for HD-20 track
8.5 pitch for TD-24 track
Sprocket rim has 25 teeth for HD-20 track; 27 teeth for TD-24 track
Section A-A

SPROCKET RIM ADAPTERS let Allis-Chalmers HD-20 tracks and International TD-24 tracks be used on Caterpillar D8 tractors. Substitution was devised by Canadian contractor combine when sufficient D8 tracks were unobtainable for its Labrador railway project.

White Universal Level-Transit...

most versatile instrument you can own!

Indispensable for these jobs—and many more



ENGINEERS agree: you can do more jobs better — at lower cost — with the White "Universal" Level-Transit. The improved Model 3000 has internal focusing, coated optics, a guarded vertical arc. Plus all the other quality features needed to give you lifetime durability and accuracy. The price: *only $185**, complete with tripod. See your dealer, or write DAVID WHITE COMPANY, 343 W. Court Street, Milwaukee 12, Wisconsin.

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We offer the most expert **REPAIR SERVICE** *on all makes, all types of instruments.*

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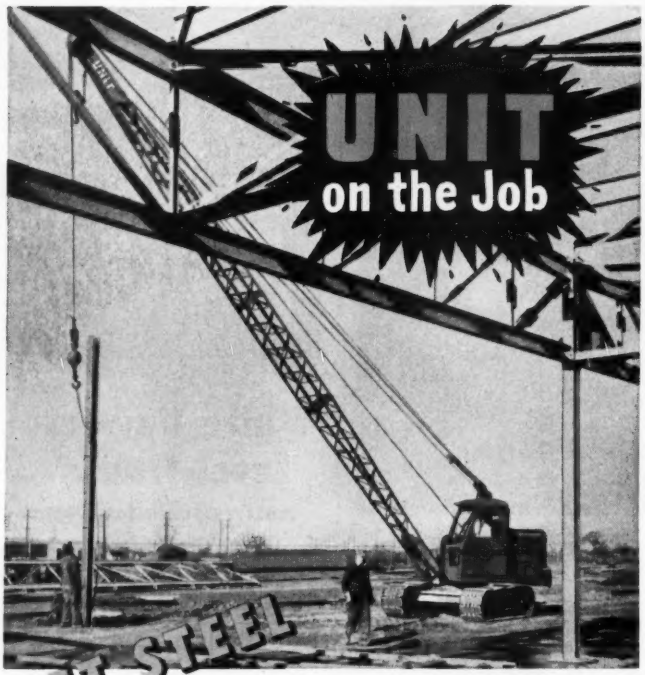

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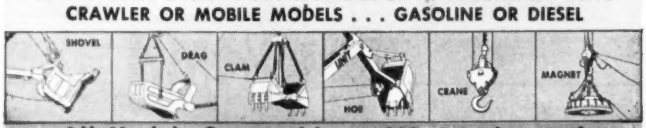
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL



All Models Convertible to ALL Attachments!

ADAPT YOUR CRAWLER . . Continued

Photos opposite →

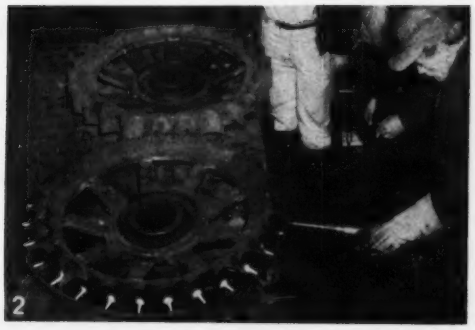
almost fruitless search produced only eight sets. (And this for a hard-working 36-machine fleet, too). However, tracks for International TD-24s and Allis-Chalmers HD-20s could be obtained. So CMMK mechanical superintendent Phil Bergeron devised adapter rims for the D8s' main drive sprockets that permitted these other tracks to be used.

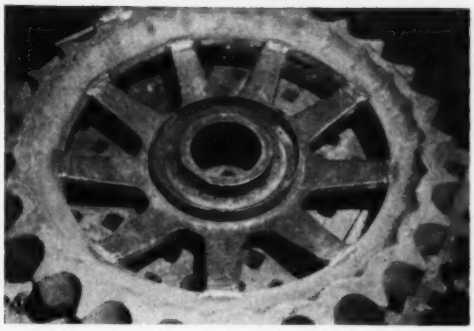
The adapter rim is welded to the D8 sprocket spokes after the existing rim has been burned off. Made of a good grade of manganese steel, the adapter is considerably heavier than the original Caterpillar rim, and thickness of metal at the root of each tooth has been doubled. Also, instead of Cat's alternate-tooth type of sprocket, the new rims are an every-tooth-working design. Wear is rotated by having an odd number of teeth in the rim: 25 for HD-20 tracks and 27 for TD-24s.

How Rims Are Attached

Details of the sprocket adapters, which were made to CMMK specifications by the Joliette (Que.) Steel Co., are given in the sketch on page 87. Procedure for attaching the rims to the spokes is shown in the facing photographs. First, the worn rim is burned from the D8 sprocket with a hand torch (*Photo 1*), although a radiograph cutting torch is normally used. Next, the new rim must be heated (*Photo 2*) before it is welded to the spokes. The preheating ring is simply a hoop made of standard ¼-in. black pipe, with 1/32-in. drilled holes spaced equally to match the sprocket teeth. Fitted to the preheating ring is a standard welding torch mixing handle.

After being properly heated, the rim is welded to the spokes (*Photo 3*). CMMK uses a Lincoln LH70 electrode for this operation, having found it the best after experimenting with several other rods. Immediately after welding, an oxyacetylene flame should be played lightly back and forth over the welds to insure that the sprocket rim cools before the welded portion does. If this isn't done quite carefully, the welds will develop thermal cracks. Then it will be necessary to burn the rim off and weld it again. *Photo 4* shows a completed sprocket ready to drive a TD-24 track on one of CMMK's D8s.





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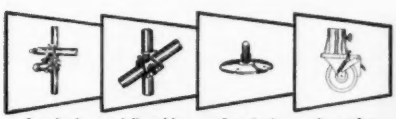
Here's another of the *many* types of scaffolds we make for every possible scaffold need. It's easily erected to fit any contour. Height, uneven ground, curved surfaces and other difficult conditions are no problem with "TubeLox".

Remember this: We make *all* types of modern scaffolds. That's a convenience *no other supplier* can offer you. Our stocks of scaffolding, spotted in major cities from coast to coast, are the largest and most complete—*one* source for every type scaffold! *Whatever your job . . . we can scaffold it for you with the* RIGHT *scaffold!*



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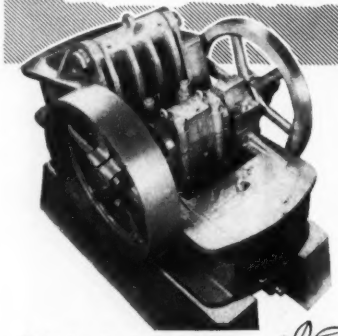
At right: Cross-section of scaffold for curved dome. Below: TubeLox installation for stone work. Only four basic parts are required. Write for Bulletin 10-PTS showing how contractors use TubeLox.

This ancient hoist . . .

was as inefficient as the crushing method used by the man in the background. But it was considered a great improvement in 1565.



Every century is marked for its notable achievements and the 20th century is no exception. Our Machine Age contains engineering and production feats which men only a short time ago considered impossible. For 50 years, Traylor has contributed its share in this development by advancing new and better stone crushing machinery for the construction industry. Construction men know that it takes experience to solve the wide variety of problems in the production of aggregate. Traylor has experience . . . half a century of it.

Traylor Type H and HB Jaw Crushers require less power per ton of rock crushed than any other jaw crusher, size for size. Ask for Bulletin 4105 for complete details.

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What's behind this consistent reliability? One good reason is the fact that every Cummins Diesel is actually built *twice*. After initial assembly, and run-in testing, every engine is disassembled, inspected; then reassembled and tested again.

This extra care—together with Cummins' economy-proved fuel system and efficient parts and service organization—makes lightweight, high-speed (50-550 h.p.) Cummins Diesels a wise first choice *for men who depend on power.*

Whatever your power needs . . . whether it's for earthmoving, portable power units or generator sets . . . or any other important jobs . . . your Cummins dealer is the man to see.

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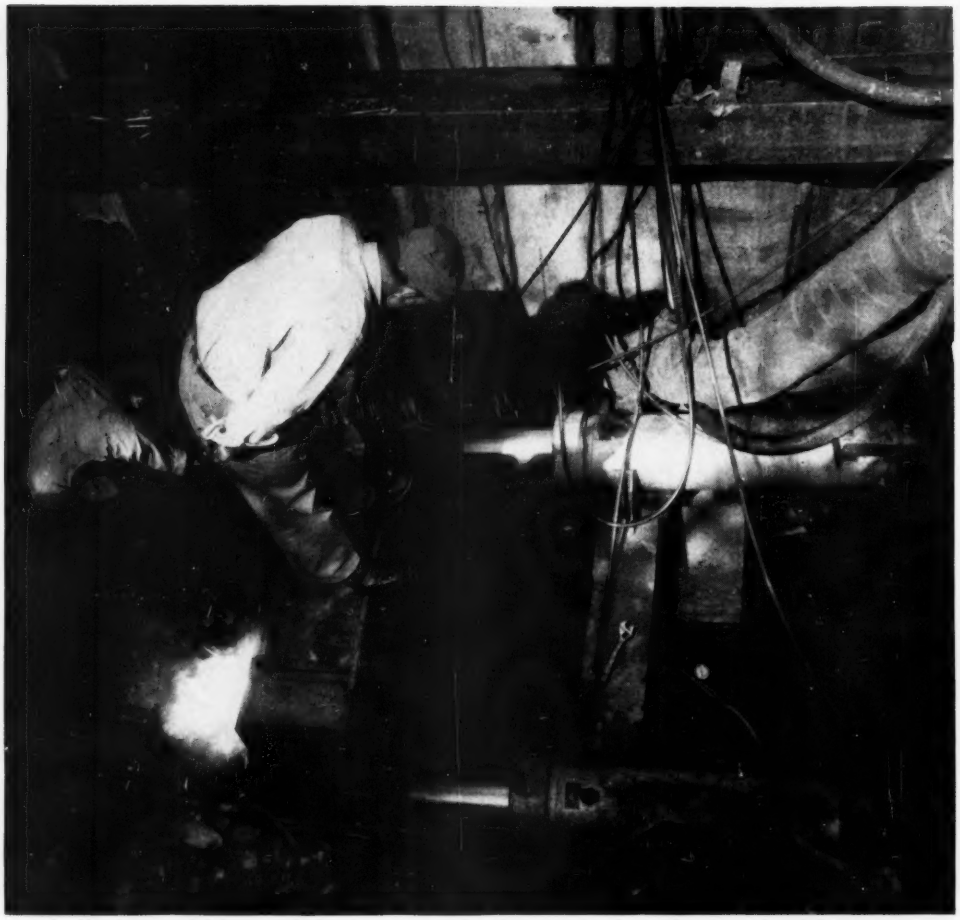


PUSHING IT IN—Standing atop 8-ft-square push-frame Superintendent Jess Comer watches two Rogers hydraulic jacks with combined 600-ton push forcing 7-ft-dia steel casing under 14 parallel railroad tracks. Meanwhile welder tackwelds push-frame to pipe. Picture was taken when pipe was half way through its 150-ft run, made up from fifteen 10-ft sections.

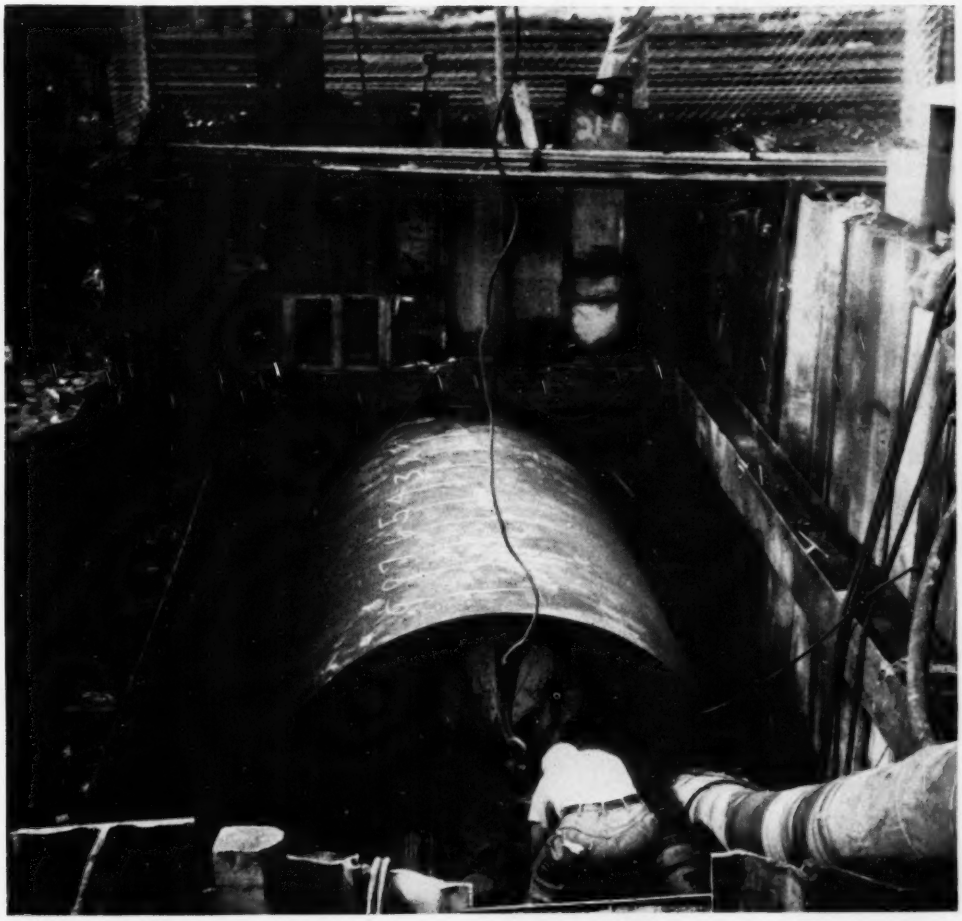
Water Main Casing Jacked Under

THE INTEREST and fascination that abounds in this construction business of ours is the result of new, constant challenges presented on each and every job and the novel methods and resourcefulness which contractors dream up to lick the problems.

The latest one we've come across—one that ended a few weeks ago—occurred in Boston where men of Merritt-Chapman & Scott Corp. had to jack a 7-ft-dia steel water-main casing 150 ft long under 14 parallel mainline tracks of the New York Central, New Haven and Boston & Albany railroads, without any interruption of rail traffic.

They had just completed a three-week job of installing, by cut and cover, a 90-ft run of the pipe across one of Boston's busiest highways, and prior to that, had lowered two consecutive 300-ft sections of the concrete-encased line into a trench across the bottom of the Charles River by a unique bolt-lowering method. (CM&E, Dec. 1951, p. 46.) Now the final act of this construction drama was the jacking of the huge casing under the tracks.

In the sheetpile-lined jacking pit they cradled two 300-ton Rogers hydraulic jacks in a horizontal position, 7 ft apart. They were tied back to timber blocks and vertical H-piles, backed up by batter piles for resistance to pushing. The first 10-ft section of the mammoth pipe was lowered into the 12-ft-deep pit, which extended to within 5 ft of the first set of rails. It was fitted with a front cutting rim plate which tapered back from a cutting edge to 1-inch thickness.



MUCKING IT OUT—While fresh air from blower on Herman-Nelson portable heater is fed into tube through canvas duct (right), laborers muck out in buggy which is crane-lifted to street. Note horizontal piece of sheetpiling carrying pulleys and pipe rods for semaphore and switch control. Jacks reached limit 30 ft short of goal, so contractor resorted to cut and cover.

14 Sets of Railroad Tracks

A push-frame, 8 ft square, was made up from H-beams and set between the plungers and the rear of the pipe section. These plungers traveled their full 48 in., forcing the pipe casing under the first set of tracks. They were then retracted and the space filled with timber filler pads. A second push then drove the big pipe to halfway mark, and cleanout crews began mucking their first dirt out of the tube into buggies which were crane-lifted to the surface. Later, with more filler blocks and more pushing, the entire 10-ft section was nosed in under the tracks.

As additional sections were welded on and subsequent pushing drove the ever lengthening pipe under more tracks, a plank walkway was placed in the tube, temporary lights were strung and a Herman-Nelson portable heater set up to provide fresh air through its blower and 12-in.-dia canvas tubing.

At the halfway mark progress was such that a new 10-ft section was added every 24 hr. The ⅝-in. thick casing was pushed 5 ft horizontally at 10 am; mucking out continued until 3 or 3:30 pm, and the final half was jacked ahead at that time. As jacking progressed and pressure and resistance increased, the flanges of the H-beam push-frame curled under increased pressure. A new one was made, reinforced with 1-in. plate, and this carried through to the end.

Also at this half-way mark, side pressure deformed the pipe into an elliptical shape which was countered by jacking the pipe into round and welding angles to

(Continued on page 96)

WEAR-ARC

There are nine basic types of Wear-Arc and Flame electrodes for every conceivable hard-facing requirement. If you have a hard-facing problem, let Alloy Rods' experienced engineers give you competent advice! ***Write for Bulletin 5651.***

A R C
LOOK FOR THE FLAMING ARC TRADEMARK

Manufacturers of Arcaloy stainless steel electrodes • Bronze-Arc phosphor bronze electrodes • Nickel-Arc and Nickel-Arc 60 electrodes for cast iron • Tool-Arc electrodes for tools and dies • Weld-Arc low hydrogen electrodes. Write for Bulletins on these products.

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Haul More Yardage At Less Cost

The "Euc" Scraper has a struck capacity of 15.5 cu. yds., 21 yds. heaped... 10 speed transmission ... 275 h.p. engine... top speed, loaded, 28.2 m.p.h.

Four wheel Euclid tractor provides easy, positive steering, excellent manouverability, and has ample power, traction and flotation for fast loading and travel on steep grades and soft fills.

Owners in all parts of the country report that the Euclid Scraper with a heaped capacity of 21 cu. yds., has outperformed other scrapers of comparable size on a wide range of jobs. As one leading contractor puts it, "The 'Euc' outhauled other scrapers, had less down time, and maintenance costs were about 50 per cent less." After completing a rush airport job, one with a wide variety of soils, another contractor stated, "We're glad that our choice was Euclid over all other makes of rubber-tired scrapers."

Because of fast, easy loading, high travel speed, good traction and flotation and excellent maneuverability, Euclid Scrapers move more loads per hour at more profit per load. Have your nearest Euclid Distributor give you complete information and job proved performance data on this Euclid Scraper—get more production at less cost!

The EUCLID ROAD MACHINERY Co.

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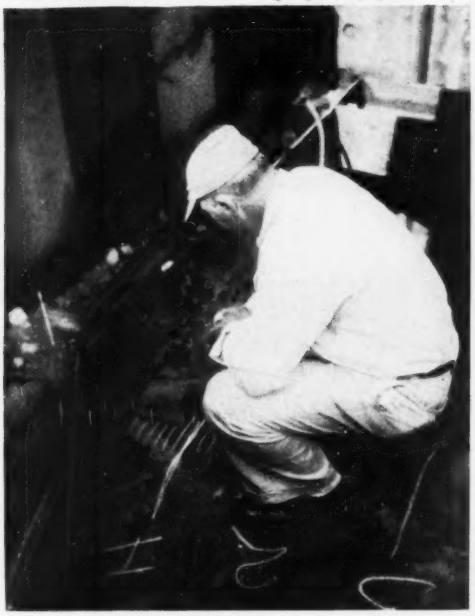
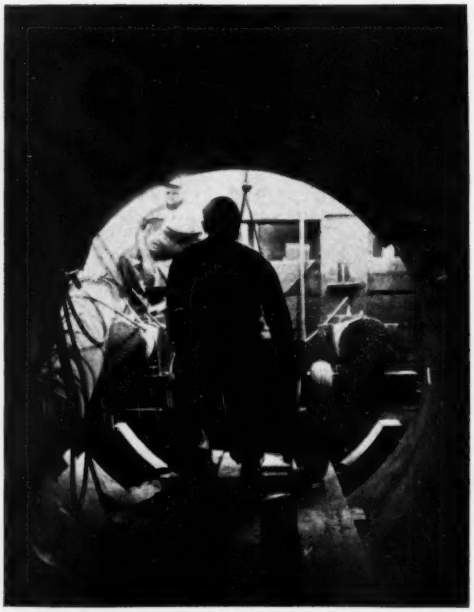


INCH MARKINGS are watched closely during push, and timed as they disappear under oak wedge, which prevents pipe from lifting. Cutting edge fastened to lead section makes cut through clay fill easier. Jacks pushed 120 ft of total 150 ft thus.

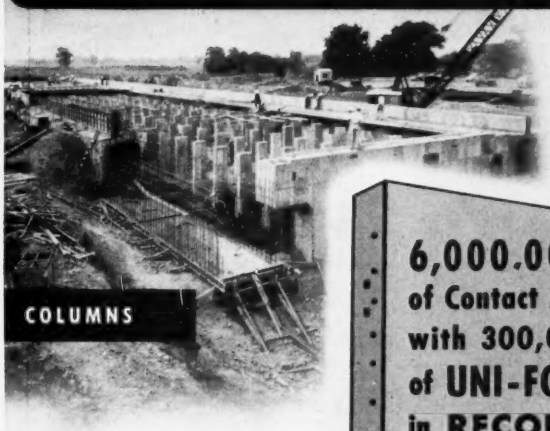


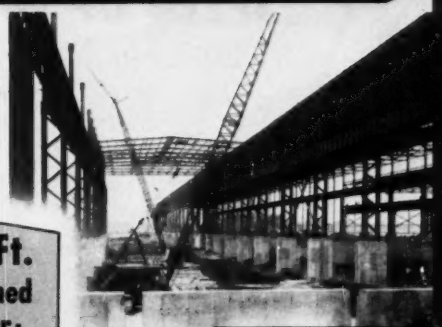
ANOTHER BUGGYLOAD exits from the big pipe to which a new 10-ft length was added on average of every 24 hr. Note jack push plates and concrete cradle which lines up new sections for butt welding. Jacks tie back to H-beams and batter piles.

Continued on page 98

H-BEAMS AND PIPE SPREADERS hold pipe in shape against increasing side pressure. First deformation was countered with angles welded to inner circumference. Additional pressure called for longitudinal beams and spreaders which were kept high enough to allow mucking buggy to pass beneath. Later 56-in.-dia pipe was placed inside big one and area between grouted.

UNI-FORM Panels Form the Concrete on The FAIRLESS WORKS of UNITED STATES STEEL CO.



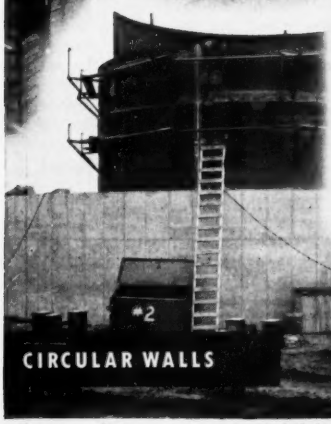


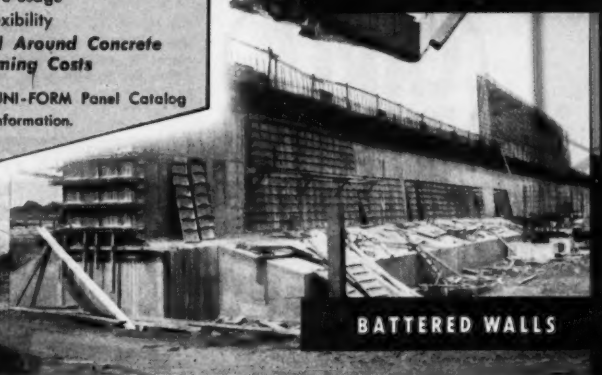
6,000,000 Sq. Ft. of Contact Area Formed with 300,000 Sq. Ft. of UNI-FORM Panels in RECORD TIME!

UNI-FORM Panels, Ties and Accessories — the world's best prefabricated concrete forming system give you:

- Faster Starts...Ready to use when they reach the job
- Automatically accurate...the Uni-Form Tie locks, spreads and spaces UNI-FORM Panels ..... in *ONE* operation
- Faster forming cycles..... quicker completions
- Maximum re-usage
- Greater flexibility
- ***Lowest All Around Concrete Forming Costs***

Write for the UNI-FORM Panel Catalog and complete information.





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Concrete Form Specialists Since 1912

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Service Wherever You Build . . . Coast-to-Coast

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CARCO WINCHES SPEED UP EVERY JOB!

Equipment stuck in the mud at the bottom of a pipe-line ditch is nothing to worry about if you have a tractor equipped with a Carco winch!

From the day you move in on a new project until the last bit of left-over material is hauled away, your Carco winch is the "pusher" that keeps other equipment working full time. It has the power and versatility needed in general contracting—clears land, wrecks or moves existing structures, tows heavy machinery—performs dozens of "bull-cooking" jobs. When you need it, it's there, yet it seldom requires attention and permits full, efficient use of the tractor for other purposes.

1st in Volume—1st in Value!

CARCO

Winches for all makes of tractors ®

Because Carco builds more tractor winches than any other manufacturer, and for more makes of tractors, you're always close to a Carco dealer with parts, service, full data on any model.

PACIFIC CAR AND FOUNDRY COMPANY

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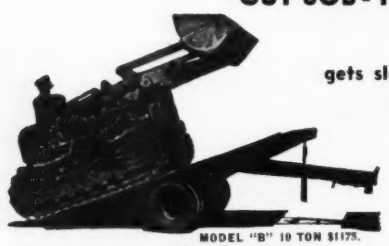
CUT JOB-TO-JOB TIME LOSS!

MILLER *Tilt-Top*

gets slow machines there faster!



MODEL "B" 10 TON $1175.

The following equipment is optional and extra: hydraulic tilt control, two speed winch, electric brakes.

Where large flat bed trailers are usually too cumbersome for lighter hauling . . . a MILLER Tilt-Top is always handy for moving slow machines from one operation to another. Self-moving equipment practically loads itself onto tilted platform and can be towed to the next operation in jig time . . . cutting non-productive time for operator and equipment to a minimum. Standard platform is 14' x 8', optional 16' available.

IMMEDIATE DELIVERY
SEE YOUR DEALER or WRITE

MILLER Tilt-Top TRAILER research engineers

Dept. C-11 457 SOUTH 82nd ST. MILWAUKEE 14, WIS.

JACKING UNDER TRACKS . . .

Continued from page 96

the inside circumference, fabricated to the 3½-ft radius. Pressure increased, however, deforming the pipe again. This time it was jacked into round again and held with longitudinal box-beams and steel pipe-spreaders—placed just high enough to allow passage of the mucking buggy. From there on, work progressed as usual.

Just 30 ft short of their mark, the jacking pumps reached their maximum combined push of 600 tons and would move the pipe no farther. Permission was granted to MC&S to take out the farthest two tracks and finish the job by cut and cover on a weekend. The contractor set to work at 6 pm on Friday night and had the last three 10-ft sections in place and the tracks replaced before 8 am Saturday; hence there was no interruption of rail traffic whatsoever.

Final step was insertion of a 64-in.-dia pipe inside the larger casing and concentric spotting with steel spacers. Bulkheads were fastened at each end of the 150-ft tubes and the space between inner and outer pipe filled with grout. A crane swung the grout in a 1-yd bucket from the street and dropped it into funnels which led into 8-in.-dia drop pipes, set every 16 ft along the length of the pipe. These drop holes had been drilled up from below just prior to placement of the inner tube and they emerged between the many sets of tracks at ground level. Steel spacers between the pipes not only kept the bottom of the inner one at proper height for concentricity, but others on top prevented the grout from floating it up against the top of the larger casing.

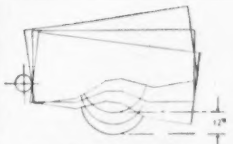
The contractor then cut-and-covered a 100-ft length of pipe in 10 days in routine fashion, a sort of anti-climax to the ticklish jacking-tunneling job.

The Men

Charles A. Richardson of Merritt-Chapman & Scott's Boston office was project manager of the pipe job (along with several other jobs in the Boston area) and Jesse Comer was his superintendent. Stewart Associates of Cambridge, Mass., were consulting engineers and A. L. Guild served as resident. Harold J. Toole, Director and Chief Engineer of the Metropolitan District Commission's Water Division, was in over-all charge of the project, with C. O. Clark representing him in the field.

compact heavier lifts
with fewer passes

Southwest COMPACTION ROLLER



Greater Oscillation

Each wheel of the Southwest Compaction Roller is mounted in an independent weight-box unit. Hinge point of wheel is at extreme rear of its own weight-box. Closely spaced wheels give maximum compaction with as much as 12" variance in height. Offers oscillating freedom and greater compaction on uneven ground.

ON THE BIG JOBS use the Southwest Compaction Roller to keep pace with speedy, 24-hour job schedules and bigger earthmoving equipment. It compacts heavier lifts with fewer passes. Weight-box units oscillate up and down independently to provide a constant compaction weight on each tire regardless of ground contours. There is no bridging, no shifting of load.

The Southwest Roller has flexibility to suit varying job requirements. Weight-boxes may be filled with wet or dry sand, earth, scrap or other materials. Sectionalized hauling yoke permits use of any combination from 3 to 6 weight-box units. Sizes and capacities range from 10 to 200 tons, suitable for light, medium or heavy duty compacting of earth.

Type Soil	Symbol	No. of Single Passes	% Moist	FIELD Dry Density Lbs./Ft.³ Passing #4 Actual	FIELD Dry Density Lbs./Ft.³ Passing #4 Corrected	OPTIMUM % Moist Pass #4 Sieve	OPTIMUM Dry Density Lbs. Ft.³ Pass #4	OPTIMUM Ratio Den.—Opt —Pass #4
Silty Sand	SM	6	7.3	128.0		8.0	133.6	96.0
Sandy Clay	CL	6	10.2	110.0		15.3	116.2	95.5
Sandy Clay	CL	6	14.3	114.0		15.3	116.2	98.0
Sandy Silt	ML	6	14.6	115.0		14.2	120.8	92.0
Clayey Sand	SC	6	9.2	125.2		10.2	128.3	97.8
Silt	ML	6	6.6	119.0		9.5	125.0	95.0
D.G.	SW	6	8.7	126.7		9.2	132.0	96.0
D.G.	SW	6	5.2	129.0		7.8	135.0	96.0
Straight Clay	CL	6	6.3	122.8		10.3	127.1	96.6
Pit Run	GW	6	4.8	133.5	126.5	7.7	134.5	95.0

The above data on unit weight of soil samples has been taken from average compacted fills placed in lifts from six to twelve inches as specified. The unit weight per pneumatic wheel load being 25,000 lbs.

WRITE TODAY for illustrated folder which gives complete data and specifications.

CONSTRUCTION MACHINERY DIVISION

thwest Welding

Alhambra, California

HAULING SCOOPS BULLDOZERS LOADERS BOTTOM DUMP WAGONS RIPPERS TAMPERS SCRAPERS TREE DOZERS

Watch the perfect control

BLASTING CLUES from the ATLAS MACHINE-GUN CAMERA

The A. E. Dick Contracting Co. got excellent confinement with the ROCKMASTER Blasting System in this stripping operation for the Hudson Coal Co. near Wilkes-Barre, Pennsylvania. There was no noisy air blast from wasted explosive gases . . . no flying rock to damage nearby equipment. There were 16 holes with 15 x 15 ft. spacing. Average depth of hole was 32 ft. and the burden was medium sandstone. ROCKMASTER electric blasting caps Nos. 1 to 6 were used in an alternate pattern.

1. *4000 lb. of dynamite ready to shoot. Note expensive equipment nearby.*

4. *Height of blast. All heave completely controlled. Minimum vibration.*

5. *Burden falls as first dust and smoke appear. Perfect blast control.*

See how ROCKMASTER can be put to work for you. Send for your reprint of the technical paper "Overburden Blasting Techniques" describing loading patterns for all principal types of overburden blasting.

ROCKMASTER GIVES MOST EFFICIENT USE OF FORCE, CONTROLLED THROW, MAXIMUM BREAKAGE.

in this ROCKMASTER® blast

2. *⅓ second after detonation shows excellent confinement of blast.*

3. *Burden still receiving full power of explosives—no escaping gases.*

6. *Spent gases finally make a quiet exit. Burden completely shaken.*

7. *Height of final pile shows excellent displacement for easy digging.*

ROCKMASTER REDUCES ALL THE NOISE, VIBRATION AND FLYING ROCK TO A MINIMUM.

ATLAS EXPLOSIVES

ATLAS

"Everything for Blasting"

ATLAS POWDER COMPANY • WILMINGTON 99, DELAWARE

Offices in principal cities

On-the-Job
CONTRACTOR-LABOR RELATIONS

by LEON B. KROMER, JR.

Christmas and Year-End Bonuses

COMES THIS TIME OF YEAR and the questions most frequently asked are:

"Can we pay a Christmas or year-end bonus to our employees?"

"Must we get approval under stabilization before paying?"

The answer is Yes, bonuses can be paid, and prior approval is generally not required if regulations of the Wage Stabilization Board and the Salary Stabilization Board are followed.

Briefly, the regulations of the WSB and SSB are as follows:

• **Flat Sum Bonus:** WSB rules say you can pay flat sum Christmas or year-end bonuses in accordance with what you did in 1950. Examples: A contractor in 1950 gave $100 to his employees. He can do the same this year. Another contractor gave all his employees one month's pay as a Christmas or year-end bonus in 1950. He can continue this same practice without getting WSB approval, even though the amount given each employee may be larger because of legal increases in pay.

• **Percentage Bonus:** If you made a practice of basing bonuses on a fixed percentage of your profits, you can do the same this year, but with this limitation. Your total bonus payment cannot exceed the higher of either:

1. The average amount per employee paid in 1950, multiplied by the number of employees receiving a percentage bonus in 1952. Example: In 1950, the XYZ Construction Co. divided $1,980 among its 10 employees, for an average of $198 per person. In 1952 with 15 employees, its total bonus payment at $198 per person, would be $2,970.

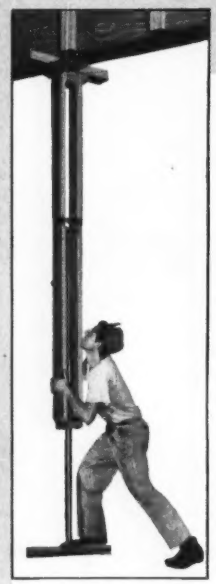
2. The average percentage of bonus paid in 1950, measured in relation to the gross earnings of all employees receiving bonuses. Example: Take the same XYZ Construction Co. cited above. Total combined gross earnings of the 10 employees who shared $1,980 in bonuses was $33,000. Dividing $33,000 into $1,980 shows the average percentage of bonus paid was 6%. The 15 employees, in 1952, earned a gross of $48,000. By the percentage formula they can receive bonuses totalling $2,880.

If you paid no bonuses in the past but want to do so now, the WSB says that you can pay each employee a Christmas or year-end bonus of $40 without approval.

For Christmas and year-end bonuses the SSB says that if you

(Continued on page 105)

Adjustable . . . 1/32" 1/8" 1/16" 1/4" to any fraction of an inch!

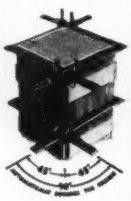


ROOSHORS
THE ONE-MAN SHORE

Rooshors are instantly adjustable to hairline accuracy . . . no fumbling with pins and no time-consuming screw adjustments to delay setting or become clogged with concrete. Wooden upper members allow nailing horizontal and diagonal bracing. Rooshors fit every job and are easily handled by one man. Three sizes: 8 ft. to 14 ft., 7 ft. to 13 ft., and, 5 ft. to 9 ft.—higher stories are shored with the Roos Extension Shores.

ROOS COLUMN CLAMPS
• fast • foolproof

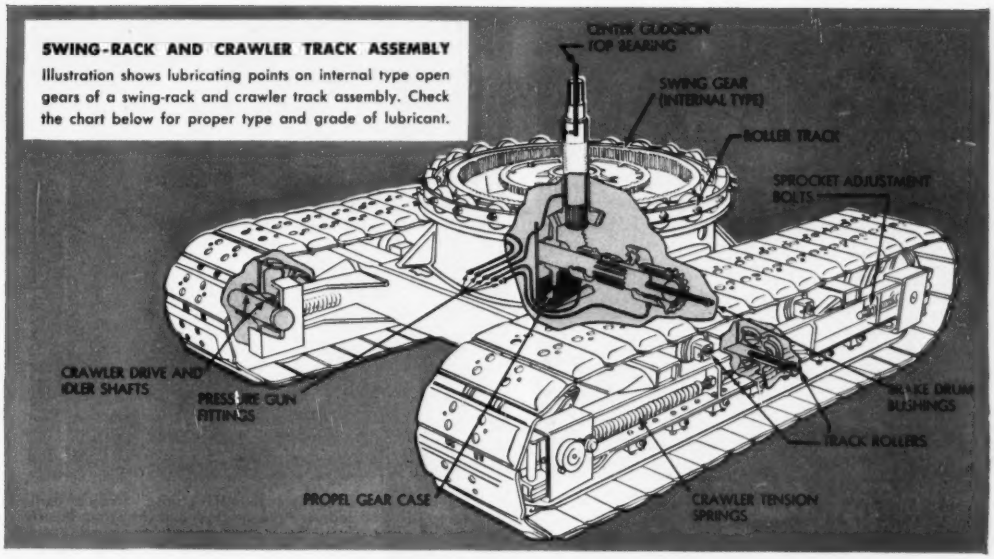
Roos Column Clamps eliminate lost time and motion in fitting and adjusting. Hinged units have castings on both legs of each hinged piece so that there is no wrong way to put them on (no rights and lefts). They automatically square the column and have no loose parts—a hammer is the only tool needed with Roos Column Clamps.



Rooshors and Roos Column Clamps are available for rental from warehouse stocks in principal cities from coast to coast.

Write today for Bulletin 152

BAKER-ROOS, INC.
602 WEST McCARTY STREET
INDIANAPOLIS 6, INDIANA


SWING-RACK AND CRAWLER TRACK ASSEMBLY
Illustration shows lubricating points on internal type open gears of a swing-rack and crawler track assembly. Check the chart below for proper type and grade of lubricant.
CENTER GUDGEON TOP BEARING
SWING GEAR (INTERNAL TYPE)
ROLLER TRACK
SPROCKET ADJUSTMENT BOLTS
CRAWLER DRIVE AND IDLER SHAFTS
PRESSURE GUN FITTINGS
BRAKE DRUM BUSHINGS
TRACK ROLLERS
PROPEL GEAR CASE
CRAWLER TENSION SPRINGS

Where, how and with what to lubricate?

Lubricating procedures and suggested materials discussed on this page represent just one of the many invaluable sections contained in the newest Cities Service EARTH MOVING AND CONSTRUCTION MACHINERY LUBRICATION BOOK. For your FREE copy, write Cities Service Oil Company, Dept. K39, Sixty Wall Tower, New York 5.

FREE: Write today for the new EARTH MOVING AND CONSTRUCTION MACHINERY LUBRICATION BOOK.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

LUBRICATION OF SWING-RACK AND CRAWLER MECHANISM

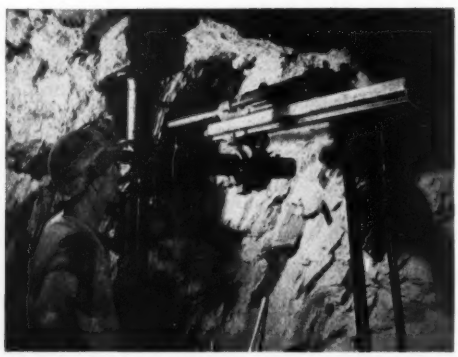
Part or Unit	How Lubricated	Lubricant Recommended	Grade No. 0°F. to 32°F.	Grade No. Above 32°F.
CRAWLER MECHANISM— Track rollers, idlers, track wheels, etc.				
Oliver:	Track Wheel System	Trojan Gear Oil	#90	#140
Allis-Chalmers:	Positive Seal Units	Trojan Grease	P-0	P-0
Others—				
Grease Lubricated:	Pressure gun fittings	Trojan Grease	A-0	A-1
	Pressure gun fittings	Trojan Grease	F-3-0	F-2-0
Oil Lubricated:	Hand gun or other means	Trojan Gear Oil	#90	#90 to #250
GEAR DRIVES—				
Open: Normal Condition	By brush or other means	Cisco Compound	#3-Z	#5-Z
Dusty Condition	By brush or bath	Raven Oil	#3	#7
Enclosed:	Bath	Trojan Gear Oil	#90	#140

Stopers at Iron King use 1-in. quarter-octagon alloy hollow drill steel. Much of the mining here is done by cut-and-fill stoping. Lead and zinc are the principal metals produced.

Jackhammers come in handy at Iron King for a variety of drilling work. Bits and rods are reconditioned at the mine. Nearly 1½ million tons of ore have been mined here since 1906.

Drilling the stubbornest ore in Arizona

Operating men at the Iron King mine of Shattuck Denn Mining Corporation believe the rock they drill is tougher and more abrasive than any other in the state. The ore at this property, near Humboldt, Ariz., is a cherty, fine-grained sulfide. Some of it is so stubborn that ordinary steel bits will penetrate only one inch before becoming dull.



This drifter bores 7-ft holes into tough sulfide ore with 1¼-in. round Bethlehem alloy rods and carbide insert bits.

Fortunately it's not all quite that hard to drill. But because of the difficult drilling conditions, the mine management has made extensive tests of both bits and rods. This development work led Iron King to adopt carbide insert bits on rods of Bethlehem alloy drill steel.

This combination has made possible increased production at lower cost per ton. Previously they used conventional bits on carbon drill steel rods. Bethlehem hollow drill steel is used exclusively at Iron King because, in the words of H. F. Mills, manager, "it's the best of the steels we've tried."

Opened in 1906, Iron King is principally a lead and zinc producer. Some gold and silver are also recovered from the complex sulfide ores. Production currently totals about 17,000 tons monthly on a two-shift schedule.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM HOLLOW DRILL STEEL

BETHLEHEM STEEL

LABOR . . . Continued from page 102
paid employees a stated portion of their salary as a bonus in 1950, you can do the same this year without approval. But don't pay more than the stated portion. If you figured bonuses as a percentage of base salary you can, without approval, apply the same percentage this year. If the base salary has been increased in accordance with SSB regulations, the percentage can be applied to the increased salary.

These are special SSB rules that apply to Christmas and year-end bonuses only. Note that, unlike the WSB, the rules of the Salary Stabilization Board relate the amount to be paid as a bonus to the employee's salary. If you base bonuses on your profits look at Salary Stabilization Regulation No. 2 which covers this type of bonus.

For Questions on Stabilization

With Wage-Hour offices no longer available for answering inquiries and processing wage cases, WSB announced recently a list of some 30 cities where you can get limited information and advice through interviews or telephone calls. These offices also will furnish necessary petition forms and copies of regulations and releases.

WSB representatives in these cities will furnish a similar service for salary stabilization matters where the Office of Salary Stabilization does not have an office. The OSS has regional offices in Boston, New York, Philadelphia, Atlanta, Cleveland, Chicago, Denver, San Francisco and Washington, D.C., where inquiries, forms and salary regulation data can be obtained.

Point to remember: All WSB petitions, requests for interpretations and rulings (in writing) and letters of general inquiry must be sent to one of the 14 regional offices of WSB (CM&E Oct. 1952, page 130).

Paducah, Ky. Looks at Labor Relations

An unique experiment in construction labor relations is going on in Paducah where a Citizens Committee for Industrial Harmony has been set up. The purpose is to find

(Continued on page 108)

Parmanco LATEST IN DESIGN

HI-SPEED HORIZONTAL DRILL

Drills a 6-inch hole in two-thirds the ordinary time

Drills 5-6-8-inch holes to 100 ft. or more

NOTE: Auger rack a Parmanco feature which saves on drilling time. Augers always handy on machine as it is moved from hole to hole. Four individually adjustable leveling jacks for faster set up and smoother drilling.

• Speed, accuracy, and mobility make this newly designed drill of special value in cost and time savings. The 40 h.p. engine with four drilling speeds makes possible the reduction of footage time by one third.

Here is greater speed in retrieving augers. Also among the numerous design features are four rotating speeds and reverse for drilling and cleaning the hole.

New design includes traction drive with both forward and reverse. The drill is equipped with self-starter and generator, dual type front wheels standard equipment, and truck type rear axle with hydraulic brakes.

Automotive steering as per illustration is optional. This hi-speed horizontal drill with greater horsepower than ever before is designed to fully meet all requirements of the construction field.

PARIS MANUFACTURING CO.

PARIS, ILLINOIS

Can you name it?

This is the "Grandpappy" of a well-known line of modern-day trucks. The photo shows clearly that transition period when the haulage industry was taking a mighty step forward in converting from horse-drawn to motor-driven equipment. If you are not sure of the name, write to us.

PERFECTION
BODIES and HOISTS

The period between the small payload truck bodies and mechanical hoists produced by PERFECTION in 1918 and their present-day high-speed, heavy-duty, large-capacity units has been one of tremendous progress in the trucking industry. This period established PERFECTION'S record of leadership in body and hoist design and earned for them world-wide trade acceptance. It is a record on which you can specify and buy PERFECTION Bodies and Hoists with confidence.

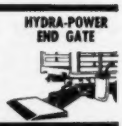
For interesting literature write today to Dept. M-112.

Photo shows a PERFECTION No. 354 Heavy-Duty Dump Body of 15-yd. capacity installed on a semi-trailer with a PERFECTION Iso-Draulic Roll-A-Lift.

STANDARD and SPECIAL DUMP BODIES

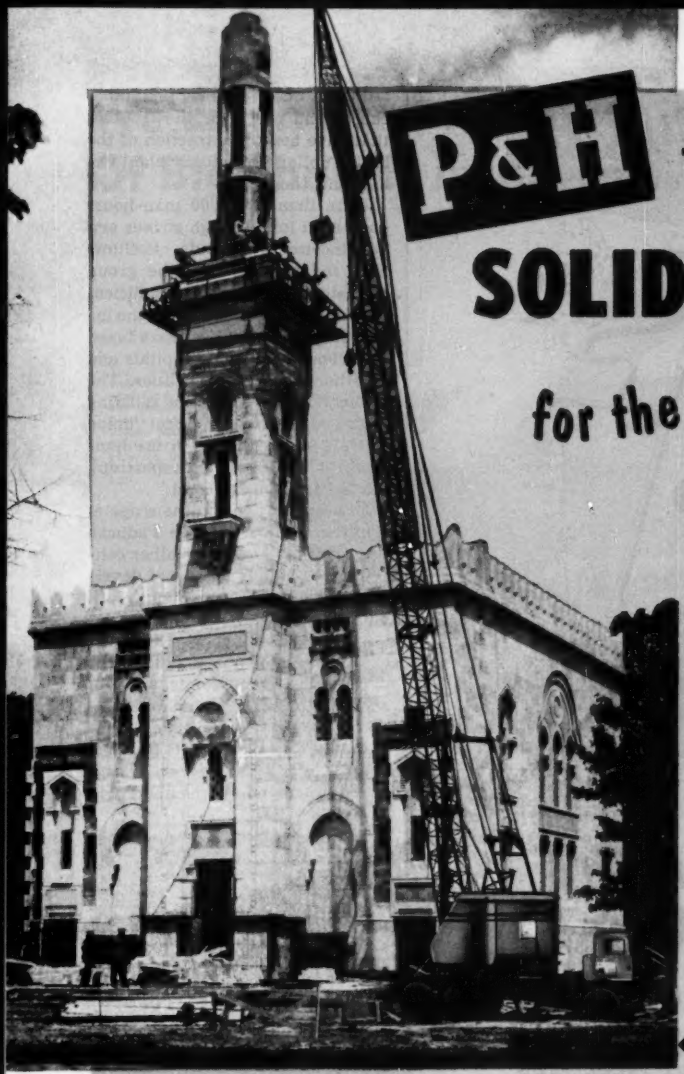
PERFECTION TRUCK BODIES and HYDRAULIC HOISTS

FOR ANY TRUCK
STANDARD or SPECIAL UNITS IN ALL SIZES • FOR ANY USE



Engineered, Manufactured, and Guaranteed by

THE PERFECTION STEEL BODY COMPANY . . . . . Galion, Ohio, U. S. A.



P&H TRUCK CRANES

SOLID FOOTING

for the Tip-Toe Reach!

Greater Stability is no idle boast with P&H Truck Cranes. Size for size, around the full 360° of operation, no P&H Truck Crane has ever been outlifted. This ability to put more on the hook means extra safety, extra capacity, extra profit for you. Add to that the smooth hydraulic control that lets you place loads precisely where you want them — dual power suited exactly to the tasks of travel and work — and you have the reasons why contractors are showing a marked preference for P&H. Better double-check now. Ask for literature.

P&H Truck Cranes are also available with remote control.

P&H Model 255A Truck Crane hoists a 2½ ton block, with 90 foot boom and 30 foot jib. This mosque, in Washington, D.C., is the first ever built in the U.S.

P&H TRUCK CRANES

HARNISCHFEGER CORPORATION

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SEE YOUR P&H DEALER

Look to P&H for the most modern features in Power Shovel and Truck Crane construction. There's all-welded design, live roller circle, triple-safe boom hoist, hydraulic control, plus a low center of gravity that provides a higher ratio of lifting capacity to gross weight. This means more WORKABILITY . . . BETTER PERFORMANCE . . . GREATER SAFETY. Write for literature on the size you need.

the P&H Line

SHOVEL · DRAGLINE · BACKFILLER · CRAWLER CRANE · MAGNET CRANE · TRENCH HOE · PILE DRIVER · TRUCK CRANE

POWER SHOVELS • CRAWLER AND TRUCK CRANES • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • DIESEL ENGINES • PRE-FABRICATED HOMES

The New Scythette POWER SCYTHE

CUTS WEEDS, GRASS, REEDS 4 TIMES FASTER THAN ORDINARY METHODS

NEW POWER • NEW ENGINEERING

Now equipped with double power, double fuel capacity. Trims weeds on rocky or uneven ground. Cuts grass or weeds close to buildings. Clips reeds or underwater growth. Cuts with ease wherever a man can walk, wade, or row a boat. Equipped with new two h. p. motor, one quart capacity gas tank, 20-inch oscillating cutter bar. Weighs only 26 pounds.

a twist of the wrist and the SCYTHETTE becomes the Sawette

America's most revolutionary chain saw cuts trees, or any growth up to 6" in diameter, level with terrain while operator is in upright position.

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Ford Tractor Conversion Kit, changes to 6 or V-8 engine, doubles the power. Makes a Ford do things you wouldn't believe possible.

With machinery becoming scarcer and prices getting higher, operators everywhere are finding it an economy to repower their equipment with FUNK Clutches and Reduction Units. Before your next repower job investigate FUNK Units. They are available in a wide variety to fit almost any requirement for shaft speed and installation space. Fit any standard SAE flywheel housing or Ford Industrial Engine. Write for specifications and prices.

FUNK AIRCRAFT CO.
3303 Airport Drive, Coffeyville, Kansas

LABOR . . . Continued from page 105

causes and cures for the troubles that have beset construction of the billion dollar-plus atomic plant being built there.

More than 2,250,000 man-hours have been lost through strikes and unauthorized walk-outs. Preliminary investigations by the group indicates that there was insufficient planning beforehand so that the influx of thousands of workers taxed the schools, housing, hospitals and all other community facilities. The tremendous growth of the building trades unions, with local union officials inexperienced in the handling of such large memberships, has led to a lot of unrest.

Few projects run to the scope of a billion dollars, but the Paducah story points a lesson for other contractors as to the wisdom of developing effective labor relations planning before starting a large job. Contractors who employ members of the building trades unions can in many cases eliminate a lot of questions on jurisdictional practices in the area, availability of manpower and similar matters by holding pre-job conferences with heads of the unions whose members will be employed.

These conferences also provide opportunity for union officials to get answers to a variety of questions that often put to rest a lot of unfounded rumors.

Enforcement Continues

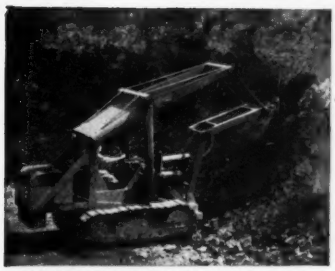
Don't look for any relaxation of enforcement of wage and salary controls in anticipation of the end of these controls next April 30. Present law terminates controls on that date unless extended by Congress.

Under amendments to the Defense Production Act, the National Enforcement Commission was set up as a separate entity after establishment of the new Wage Stabilization Board. The jurisdiction of the Commission is now extended to all violations of wage and salary regulations.

The Commission warns that it will continue to impose sanctions where violations are found and on cases in process up to April 30. Sanctions imposed will not be dropped even after termination of controls.

We Engineered the Mechanical Advantages Of Big Shovels into the Dempster-Diggster

The Dempster-Diggster's ability to dig hard and stratified materials without shooting is shown in photo at right. Note ample loading clearance. Dempster-Diggster, shown at work in Florence, Ala., is the Type GRD, Model 100.



This Dempster-Diggster, shown at work in Creighton, Pa., is also loading hard and stratified material without shooting. It is the Type CR, Model 100.

The Type GRD, Model 100-HL is shown above loading Hopper Bottom car, height of which is 10'8" from rail to top of car.

Simultaneous Independent Hydraulic Crowding and Hoisting, Variable Crowd Action at Any Dipper Position and Changeable Buckets are engineered into the Dempster-Diggster. Many of the present Dempster-Diggster owners were at one time in the same position you may be in today. They needed front end loaders, but they also needed shovels that could dig out 15 to 18 foot banks. The versatility of the Dempster-Diggster, plus its economical and efficient operation, left them with only one choice. In the first place, the Dempster-Diggster can do anything a conventional front end loader can do—and do it faster and at less cost! Second, on big jobs the Dempster-Diggster is without equal for working in tight places. The Dempster-Diggster is available in either of two types of traction—pneumatic (Type GRD) or crawler (Type CR). Both types are supplied in two models—the Standard (Model 100) or High Lift (Model 100-HL). Our new catalog No. 1032, with over 35 illustrations and complete specifications, shows how this revolutionary shovel can cut your costs tremendously. For your copy fill in the attached coupon and mail today!

DEMPSTER DIGGSTER

Please send me, without obligation, your Dempster-Diggster Catalog #1032.

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DEMPSTER BROTHERS, 3112 Shea Bldg., Knoxville 17, Tennessee

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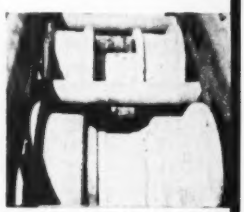
Use VICTOR Hardfacing Rods on Parts Subjected to Abrasion, Shock, Corrosion and Heat.



Available in a full range of sizes for both acetylene and electric AC and DC application, both hand and automatic. Order a supply from your VICTOR dealer today.

THIS HARDFACING ROD	FOR THESE CONDITIONS	FOR SUCH EQUIPMENT
VICTORALLOY	Abrasion and severe impact	Tractor rollers, dredge pump impellers, bucket lips and teeth, rock crushers, steel mill wobblers
VICTORTUBE	Severe abrasion	Scarifier teeth, dredge cutter blades, posthole augers, oil field tools, ditcher teeth
VICTORITE	Earth abrasion or sliding friction	Plowshares, cultivators, steel mill guides, cement chutes, shaft bearings, rolling mill guides
VICTORITE 1	Corrosion, heat and abrasion	Saw-teeth, carbon scrapers, wire guides, rocker arms
VICTORITE 6	Red heat, impact, corrosion and abrasion	Blanking, forming and trimming dies; cams, hot punches, pump shafts
VICTOR TUNGSMOOTH	Thin cutting edges	Coal cutter bits, brick augers, pug-mill knives, screw conveyors

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For better welding equipment and supplies look for the VICTOR dealer sign. Dealer inquiries invited.

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Each completed DUALOC Boom Cable assembly is proof tested to two times its rated capacity before Registry Certificate is issued. DUALOC assemblies are the only replacements for wire rope sockets which do not lower safety factor originally built into your equipment. They are easy to install as their endings have same dimensions as zinced sockets. No alterations to equipment are necessary.

Write today for literature and quotation.

*Trade Mark Registered. Patent No. 2463199.

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ADVANTAGEOUSLY

—GET THIS
VIBRO-PLUS
"TOPDOG"* VIBRATOR

It's equipment of a thousand uses—for speeding the flow of materials through hoppers, bins, chutes—for vibrating tables or screens in packing, sorting or testing—for effective noiseless vibration in casting, mixing or loading—in fact, wherever a vibrating impact is useful, VIBRO-PLUS offers these exclusive advantages: Greatest ease of attachment—unsurpassed versatility—extreme lightness of weight—and real "heavy duty kick." Tell us your vibrating problems—we'll send you the proper bulletins.

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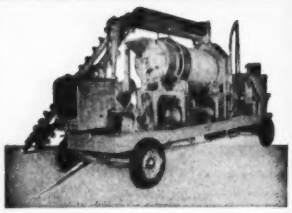

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Complete units for maintenance and moderate contract paving. Sizes—4, 8, 15, 30 tons per hour.

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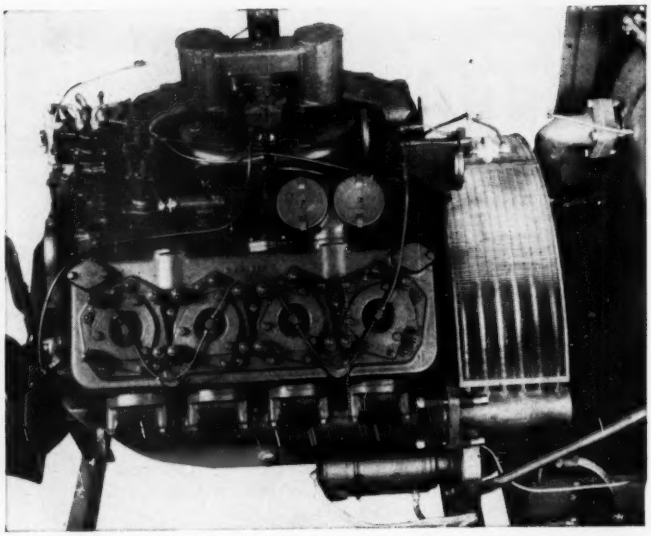
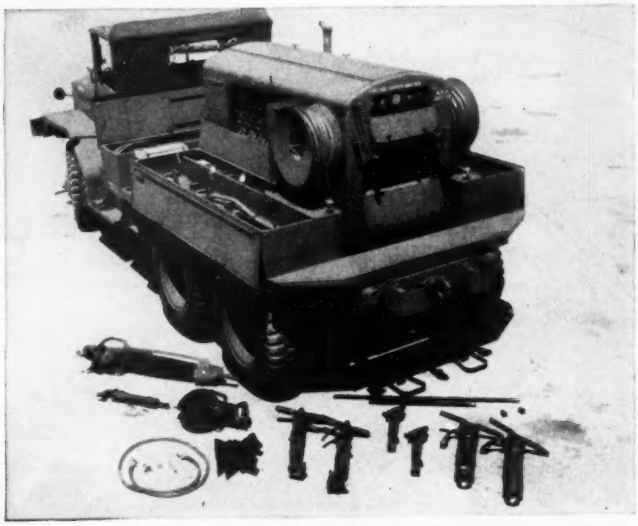


COMPRESSOR SIDE of V-8 rig has bank of compression cylinders that are matched by bank of engine cylinders on other side. Semicircular air cooler (right) is a pressure-tight core with fins that dissipate heat from air as it's passed from compression cylinders to receiver. Fins on flywheel beneath produce flow of air to assist in coooling.



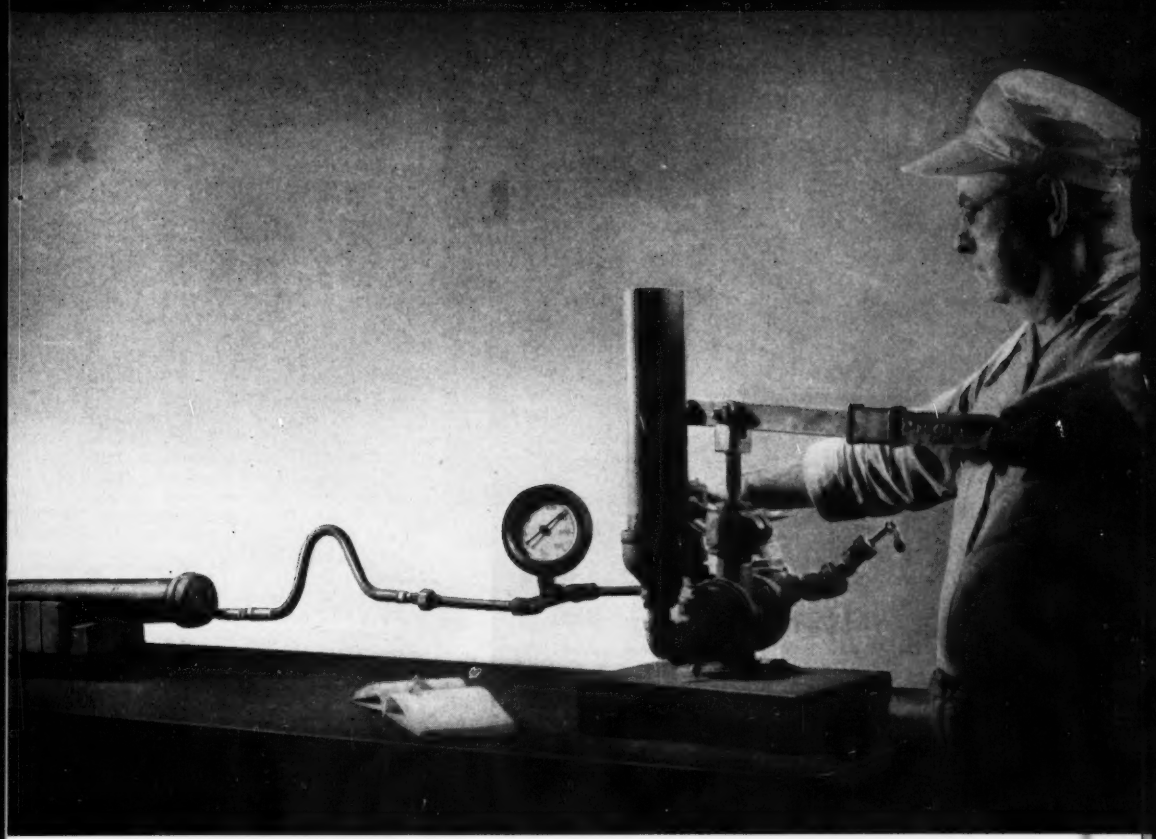
COMPLETE MILITARY model of new Le Roi V-8 210 motorized compressor includes 2½-ton 6x6 truck, with double hose reels and hose. Standard tools include, right to left: 2 paving breakers, 2 medium weight sinkers, 2 clay diggers and a sheeting driving attachment. Extras include extensions and fittings, circular saw, wood borer and chain saw. Units will not be available to civilians until late 1953.

LeRoi Develops V-8 Compressor

Another Equipment Development Report

Story begins on page 114

PROGRESS IN EXPLOSIVES...



FOR WORKING UNDER PRESSURE

Hercules' research has developed explosives that shoot successfully even under the severe water pressures encountered today in seismograph prospecting.

In the laboratory test shown here, a cartridge of Hercules Vibrogel® 3 is sealed in the steel "bomb" at the extreme left. It then undergoes prolonged exposure to pressures greater than those ordinarily found in actual field use. Because Vibrogel 3 embodies a new conception of explosives research, it detonates despite these extreme conditions.

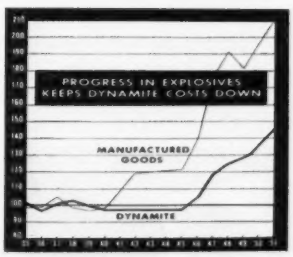


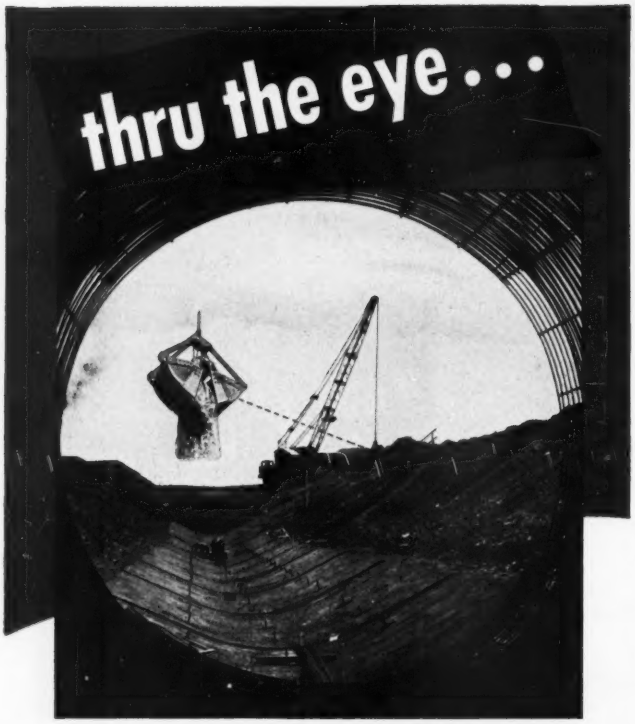
Chart shows relative stability of dynamite prices since 1935, as compared with prices of other manufactured goods. 1935-39 values=100.

HERCULES POWDER COMPANY

INCORPORATED

Explosives Department, 974 King St., Wilmington 99, Del.

XR52-7

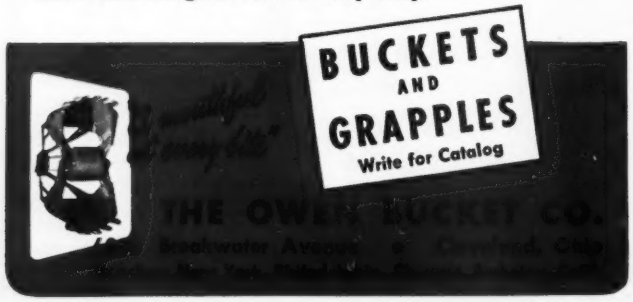


of a Culvert, a Contractor, or an Operator an OWEN BUCKET *"looks good"*

To a practical person looking out of a culvert such as this one, comes the suggestion of exceptionally great and economical digging ability or an Owen Bucket wouldn't have been selected.

To the contractor it recalls consistently good performance for years which has prompted him to reorder Owen Buckets year after year.

To the operator comes a reminder of how an Owen Bucket performs under varying difficult conditions, responding to his every demand and "stands up" with outstanding ability long after many buckets would have been relegated to the scrap heap.



V-8 COMPRESSOR . . .

Continued from page 112

By JAMES M. CONNOLLY
Equipment Editor

"The difficult we do right away. The impossible takes a little longer."

That's one of the phrases coined during World War II and it applies equally as well to the Le Roi Company for their accomplishments in meeting — and bettering — the severe demands put on them by the Corps of Engineers for a radically new lightweight, high-output, portable compressor.

The "impossible" demand was this, in a nutshell: "We want a portable 210-cfm compressor, but it must be lighter than your 105-cfm model that we used during the war." After a good deal of time and effort, Le Roi came up with the answer: A combination engine-compressor in the form of a V-8 engine with one bank of engine cylinders opposite the other bank of compression cylinders. Here's the story behind its development:

Admittedly one of the most important pieces of equipment used by the Corps in demolition and all kinds of construction work, the truck-mounted air compressor had to be improved, the Engineers said. They wanted twice as much air, an increase in the fixed tool and accessory load, multiple tool application but no loss of mobility or speed in transit. Other limiting specifications were that maximum air temperature would be 250 deg F (with ambient of 120) and that the unit would be able to develop 35% surplus hp.

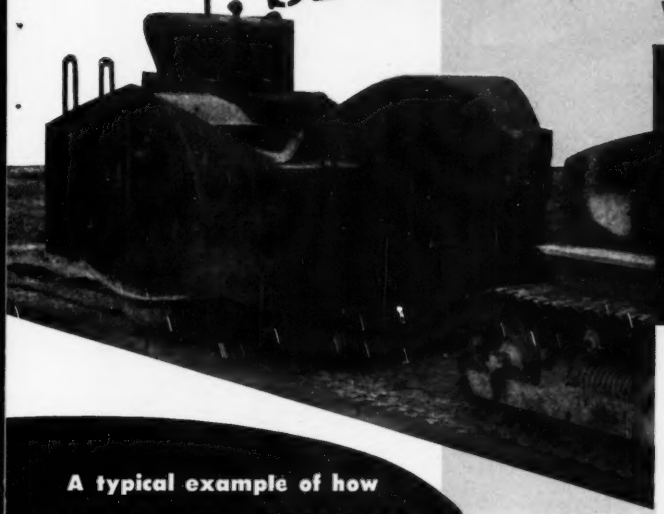
Their standard piece of equipment during World War II had been a Le Roi 105 mounted on a 2½-ton 6x6 truck. More than 10,000 of these were made and delivered by Le Roi between 1941 and the end of the war.

With this confidence behind them, and realizing that theirs was the only company that made both its own compressors and gas engines, the Le Roi men, from the boss down, set about to lick this "impossible" problem.

First, they substituted aluminum freely in place of cast iron. Every component part was studied with an eye to making it lighter without weakening it, but it was soon apparent that the standard engine-

(Continued on page 117)

Now YOU CAN OBTAIN SPECIFIED DENSITY IN FEWER PASSES WITH THE



Cedarapids Vibratory COMPACTOR

UNEXCELLED FOR MAXIMUM SOIL COMPACTION

- ✓ on highway subgrades and bases
- ✓ airport runways
- ✓ any soil and graded aggregate construction

A typical example of how CEDARAPIDS COMPACTORS save time and money

Before a Cedarapids Vibratory Compactor was used on a California highway job which was almost entirely new location construction, the contractor had to *remove* two fill areas and then replace them, as he was unable to get the required 90% density with another type of roller. By using the Compactor in the new fills, he was able to reach 90% density in one to two passes over 4" lifts. The only time the contractor had previously been able to reach this density was when *more than 16 passes were made over each lift!* As he was being paid only his bid price, *and no premium for compaction,* his savings with the Cedarapids Compactor were substantial.

IMAGINE a 60,000-lb. weight being slammed against loose soil by a powerful vibratory thrust 600 to 1,400 times a minute! Man, that's an impact-compacting action you can't beat for reaching specified densities *fast,* with less labor and lower cost.

That's what you get with the Cedarapids Vibratory Compactor. It operates on an entirely new principle... the flotation of heavy loads *without* lateral soil displacement, aided by a powerful compacting vibratory thrust through the pneumatic tires.

This positive, directed vibratory action does more than just press the soil down. It actually rearranges the soil particles, forcing out moisture and eliminating air voids to increase cohesion and mechanical bond. It assures greater structural strength, higher shear strength and increases subgrade support. And you're not restricted to putting in your fill in 3" or 5" lifts. You can spread from 12" to 36", depending on material, and compact it right down to a firm foundation, usually in one or two coverages.

The vibrating mechanism on Cedarapids Compactors is a newly designed, heavy-duty style built for long-lasting service. Vibration is transmitted to the axle and tires only... there's no vibratory wear on the rest of the machine. With *vibratory* impact-compaction, you can obtain and often *exceed* specified densities other rollers cannot reach, and in fewer passes.

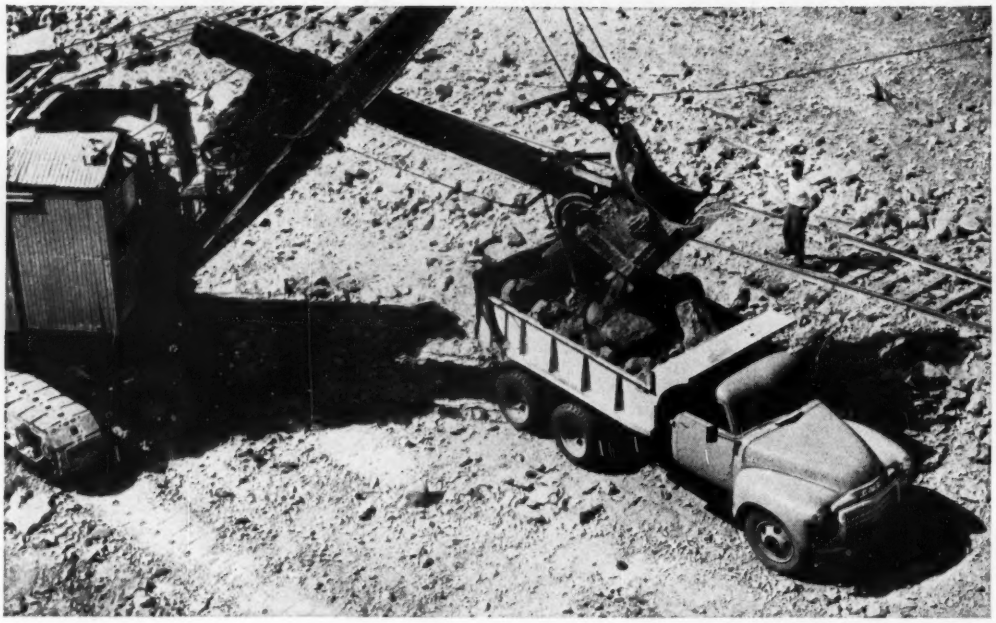
Cedarapids Compactors, both Model 60 and Model 25, can be adapted to a wide variety of soil and moisture conditions simply by varying the rate of vibration (over a range 600 to 1400 cycles per minute), and by changing tire pressure and adding or reducing weight.

There are so many outstanding features in this improved machine we can't begin to list them all here. See your Cedarapids distributor today for complete details.

There's Nothing Like It ON THE MARKET

It's the only vibratory, rubber-tired compacting unit available. Its entirely new principle of operation... weight plus vibration... permits more compaction than ever before possible, in fewer passes! Write for details and specifications, plus many typical job test reports described in Bulletin COMP-3.

IOWA MANUFACTURING CO.
Cedar Rapids, Iowa, U. S. A.



TOUGH OFF-THE-ROAD CONDITIONS like this call for the rugged power reserve and rim-to-roof, *all-truck* construction found in GMC's new W450-30 six-wheeler. It's available in five wheelbase lengths from 149 to 197 inches for use with medium dump, concrete mixer or general purpose body.

When a job calls for "Extra Push"

–GMC's new W450-30 six-wheeler delivers the goods!

GMC'S NEW W450-30 SIX-WHEELER can take rugged going like this because an extra differential acts between the dual-drive rear axles to deliver husky drive where it's needed – eliminating power waste and tire fight. The W450-30 also has provision for an *optional* inter-axle lock-out operating from the dash.

WHEN THE CHIPS ARE DOWN, GMC's great new 26,000 GVW six-wheeler delivers all the extra power you'll need to get your job done—and get it done on schedule!

No comparable six-wheeler today can match its sensational new 145 H.P. power plant. It delivers the most might per pound in trucking history from a record-shattering 7.2 compression on *regular* gasoline.

That's why it's no problem for the W450-30 to cram extra trips into a day's work – without strain or struggle. It can zoom capacity loads out of the pit with less gearshifting than any similarly rated truck you've ever used.

But get the whole story from your GMC dealer. Find out how surprisingly little it costs to put this great new six-wheeler on your next job!

GMC TRUCKS

Another General Motors Value

GASOLINE 4,800 GVW TO 90,000 GCW
DIESEL 19,500 GVW TO 100,000 GCW

Watch the TV Football Game of the Week Every Saturday on NBC Television.

V-8 COMPRESSOR

Continued from page 114

plus-clutch-plus-compressor combination just wouldn't work. A radical departure was needed.

Shortly after the war Le Roi had designed and marketed a combination air compressor and tractor which employed a single in-line block for both the compressor and tractor engine. Following this lead, the late C. W. Pendock, Le Roi's founder, proposed a combination air compressor and engine designed on a V-8 principle as a solution. This was it! But the problems were many.

It was obvious from the outset that the job was not merely one of replacing one bank of cylinders with a bank of compression units. On the contrary, many distinct design problems arose. A well-balanced crankshaft, proper cylinder bore sizes, well-filtered air inlets, unusual cooling, and a host of other problems had to be licked before the new 210 finally took shape. The single-stage compressors rolling off the line and through the testing stage right now for delivery to our fighting forces in all theaters of operation have a bank

REMOVABLE CYLINDER LINERS on both engine and compressor sides eliminate reboring operations and provide cylinders with uniform cooling gradients. Unit produces 210 cfm at 90 to 100 psi, yet weighs less than World War II model that produced only 105 cfm.

of four engine cylinders on one side and four compression cylinders on the other, as first conceived by Pendock, and represent the combined ingenuity and thinking of many men both from the Le Roi Company and from among its suppliers.

The standard 105-cfm model from World War II weighed 4,300 lb dry, with housings. By com-

(Continued on page 120)

FORM OPERATING CYCLE SLASHED TO 300 MAN-HOURS PER STRUCTURE ON THIS CONCRETE IGLOO JOB!

You can cut costs to the bone on other forming jobs with TRAVELING STEEL FORMS designed and built by BLAW-KNOX

HERE'S a typical example of Blaw-Knox engineering accomplishment in simplifying forming methods. Developed by Blaw-Knox engineers for the construction of Igloo-type storage buildings for the Government, these traveling steel forms reduced form-moving cycles to less than 300 man-hours on each building! They are so effective and yet so simple that slow, "back-breaking" handling was completely eliminated from operations. *There are no hand-handled panels!* Inside forms are handled by a traveler . . . others by winch trucks.

Look at the way they're designed. You can see that fast tunneling methods were put to work on surface jobs.

Whether your concreting operations call for forming above or under ground, remember . . . Blaw-Knox engineers have years of experience in simplifying forming methods. That's why it's important to consult with Blaw-Knox first, in the preliminary planning stage, before bids are submitted. We will study your job and recommend the most suitable form design to save you time and money. Blaw-Knox Steel Form Consultation Service is ready to help you from preliminary planning to final pour. Write, wire or phone today.

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Get complete details about Blaw-Knox Steel Forms and the consultation service that is available to any contractor without obligation.

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BLAW-KNOX DIVISION of Blaw-Knox Company

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Equipped with Hydraulic Booster Steering and Big Front Tires in 1945 — they made heavy-duty grading easy, positive, and efficient on any operation — jobs are done fast, with least operator fatigue.

Big tires give best flotation . . . least side drift . . . high front axle clearance.

You get top performance . . . . most for your money when you buy GALION GRADERS.

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Hydraulic Booster Steering has been STANDARD EQUIPMENT FOR 7 YEARS

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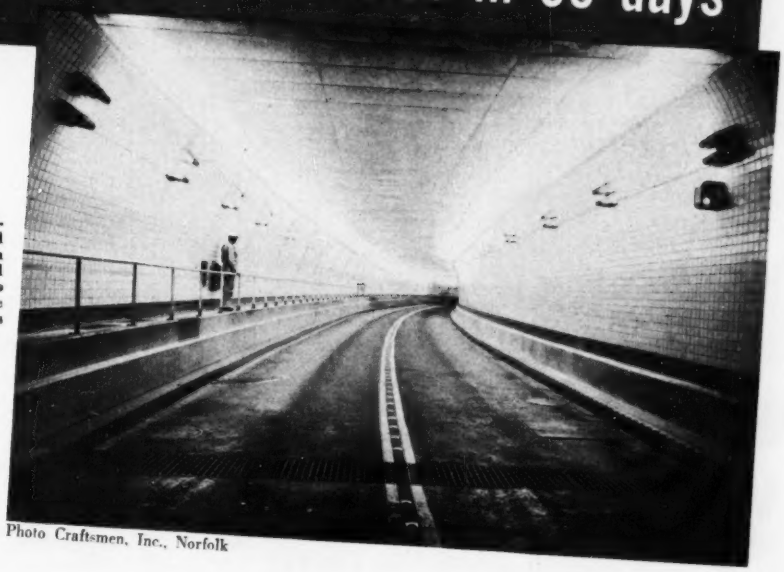
Heavy-duty Texaco Asphaltic Concrete paving in Virginia's new Norfolk-Portsmouth tunnel serves...

1,000,000 vehicles in 80 days



READY FOR BUSINESS—Newly completed Norfolk - Portsmouth Tunnel, which is served by a hot-mix Texaco Asphaltic Concrete pavement, laid by Ames and Webb, Norfolk.

Photo Craftsmen, Inc., Norfolk

Virginia's new Norfolk-Portsmouth vehicular tunnel under the Elizabeth River was opened officially on May 23rd this year. Preliminary estimates of the tunnel's traffic proved to be on the conservative side. By August 10th—80 days after the opening—1,000,000 vehicles had passed through the new facility.

The pavement which serves the exceptionally heavy traffic of the Norfolk-Portsmouth Tunnel is hot-mix Texaco Asphaltic Concrete. It was constructed in two courses, having a combined thickness of five inches in the center, tapering off to two inches at the sides. The 22-foot wide pavement is divided into two lanes by colored tile blocks, six inches square, which are embedded in the asphalt mix.

Hot-mix Texaco Asphaltic Concrete paving is a sound investment wherever heavy traffic must be served. Its ability to absorb severe impact, its freedom from joints, low susceptibility to temperature changes and immunity to ice control salts, all contribute toward a long life with a minimum of maintenance and a low annual cost.

Hot-mix Asphaltic Concrete is one of a number of plant-mixed types of asphalt paving for streets, highways, airports and tunnels. These types vary in the grade of asphalt and kind of aggregate employed in the mix. One of these types may supply the best answer to your paving problem, under your particular conditions, including available aggregate, volume and weight of traffic to be served and money limitations. Helpful information concerning these pavements is supplied in a booklet entitled "Texaco Asphalt Paving—Plant-mixed Types", copy of which will be sent you without cost or obligation by our nearest office.

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MEETS EVERY NEED!

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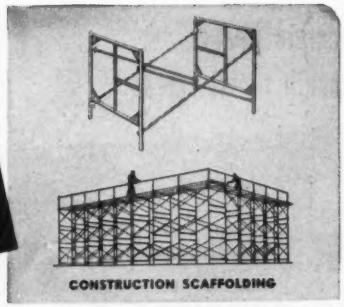

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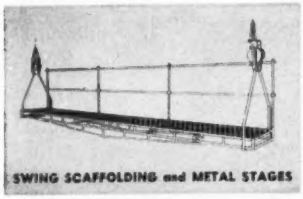
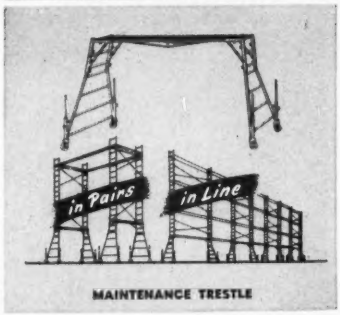
No matter what scaffolding your work requires, Bil-Jax has it . . . fixed, rolling and swing type. Get maximum safety and satisfaction. Rent or buy. Distributors in principal cities.



SWING SCAFFOLDING and METAL STAGES



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THE WELLMAN ENGINEERING COMPANY

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V-8 COMPRESSOR

Continued from page 117

parison, the new V-8, 210 model weighs only 3,100 lb with housings, hose reels and hose. Le Roi met the weight challenge and bettered it by 545 lb. Tool boxes and a complete complement of tools weigh 2,400 lb, bringing the gross weight to 5,500 lb, wet, for the new 210.

Valve-in-head design was incorporated for easier accessibility and better valve cooling. Hardened valve seat inserts and valve rotators give both the compressor and engine unusually longer valve and seat life. The unit has replaceable cylinder sleeves, following Le Roi's standard practice in both engines and compressors. These eliminate reboring operations and provide the cylinders with uniform cooling gradients. Downdraft carburetion insures fuel economy, and positive filtration at both engine and compressor inlets guards against damage by foreign matter.

Unique Cooler

The Army's air temperature requirements were particularly demanding, since the hose they use is of a special type that sacrifices heat-resisting tendencies for adequate sub-zero operating characteristics. This called for a unique air cooler that's semicircular in design and sits above the engine-compressor flywheel between the compressor discharge and air receiver. Measuring 36x16x12 in., it's a pressure-tight core with fins that dissipate the heat of the air as it is discharged from the compressor cylinders and passes into the receiver. It's an aftercooler, but it operates quite similarly to an intercooler on a conventional type compressor. The flywheel beneath it has a set of fins which produce a flow of air to assist cooling.

The V-8 operates between 90 and 100 psi, held between these limits by an unloader. The 4-cyl, 499-cu-in. engine bank is held at idling speeds when pressure hits 100 psi; is automatically revved up for additional pressure when it drops to 90. The engine develops the Army's specified 35% surplus hp at the amazing low speed of 1,125 rpm, thus insuring long life and durability for the unit.

As for maintenance, the entire spring-mounted unit can easily be lifted off the truck for overhaul or replacement without disturbing the

(Continued on page 122)

Designed to Lead the Field

the New A.O.Smith Field King

GAS ENGINE-DRIVEN DC FIELD WELDER

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It's the A. O. Smith "Field King," built to thrive on rugged jobs in the field . . . to endure the rough handling of transport . . . to withstand any weather . . . and to turn out better welds, faster and smoother!

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"Combat-tested, time-tested" engine of 20% greater horsepower than conventional machines; exclusive, patented electric idling control; a more efficient machine that has less bulk than older types . . . these, plus many other features, make the "Field King" the field welder for you!

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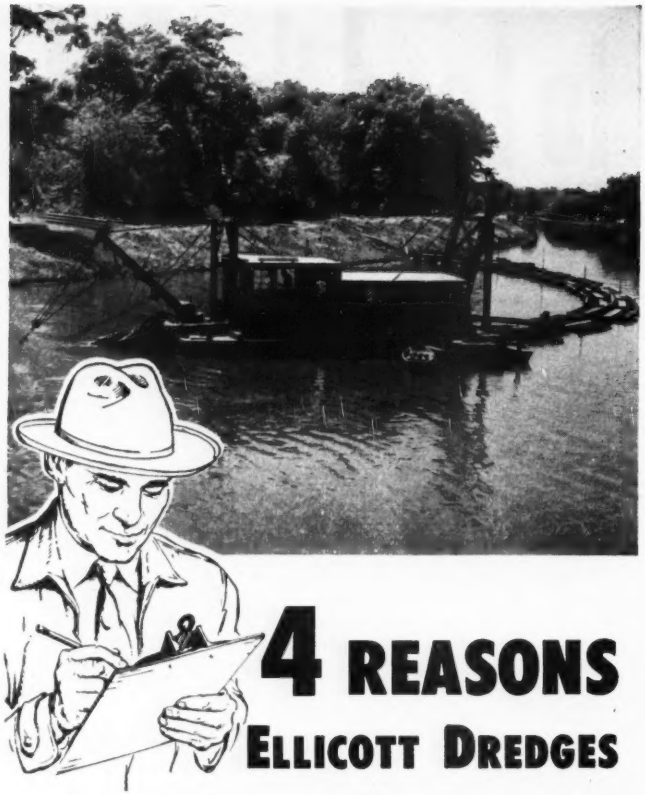

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For more information about Ellicott Dredges and how they can make more money for you, write for our new General Catalog No. 825, which shows over 100 views of Ellicott Dredges. Address · ELLICOTT MACHINE CORPORATION, 1605 Bush Street, Baltimore 30, Maryland.

ELLICOTT®

ELLICOTT DREDGES

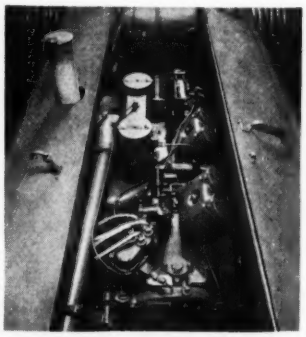
V-8 COMPRESSOR

Continued from page 120

tool-box arrangement. It's provided with wide side and top doors for access to working parts.

The compressor works on a 24-v system with battery, distributor and coil inclosed in a waterproof housing. Wiring provides for suppression of severe radio interference. Starting and operating controls are concentrated at the rear between hose reels for accessibility and good operator visibility.

Flexibly mounted tool boxes on either side sandwich the unit, and a fixed box is located between it and the truck cab on the military model. Le Roi Co's Cleveland Rock Drill Division supplies two medium weight sinkers, two heavy paving breakers, two clay diggers, and a sheeting driving attachment for the heavy breaker. When units leave the Milwaukee plant they also have all necessary drill steels, bits, etc. Other tools, such as chain saws, wood borers, circular saws or nail drivers, can be supplied by Le Roi's venders.



WIDE TOP AND SIDE DOORS give access for checkup and maintenance. Entire spring-mounted unit can be lifted out for major repair, overhaul or quick replacement. This feature will undoubtedly allow quick change-over to trailer-mounted contractors' models when military demands ease up.

Unfortunately, there are no V-8's for sale to contractors and other civilian users, since Uncle Sam is taking them as fast as they run off the assembly line and through the testing stage. This situation will continue at least until late 1953, but meanwhile you can bet that Le Roi men who met the challenge with the V-8 210, will be figuring out ways to mount them so that contractors can tow them around from one location to another on pneumatic tires for use on a myriad of jobs.

How PROSPEROUS Is The USA?

Just how prosperous *are* the people of the United States?

The sole purpose of this message is to help clear up the confusion and controversy that surrounds this important question.

To find out how much prosperity, or material well-being, the people of the United States now enjoy, it is necessary to get answers to these questions:

1. As compared with other times, what is the total amount of goods and services that we have available for our enjoyment?

2. How great, on the average, is the share of each American in this prosperity?

3. How does our prosperity compare with that of other nations?

National Product at Peak

The government statisticians who do the bookkeeping for the nation produce a figure called the Gross National Product. It is supposed to be the total obtained when you multiply the amounts of everything we produce by the prices of everything produced. This year the GNP, as it is commonly tagged, will add up to something like $345 billion.

Since this will be the highest total that GNP has ever attained, some people will acclaim it as evidence that we now are enjoying the greatest prosperity on record.

The GNP, however, is not an accurate yardstick of prosperity. It may go up because of price inflation alone without any increase at all in the output of goods and services. Also the GNP includes very large amounts of goods and services, such as those for the military, which are in fact a result of misfortune rather than of a condition that might properly be called prosperity. Moreover, there is no deduction from the GNP to make allowance for the equipment that is worn out in producing it.

Little Recent Progress

When we make adjustments such as these – to find out how much of our production really is available for the use and enjoyment of the civilian population – the *adjusted* national product since the beginning of World War II comes out about as follows. The effects of price inflation have been removed from these figures.

YEAR	ADJUSTED NATIONAL PRODUCT	
	Billions 1951 Dollars	Index (1946 = 100)
1940	$176.2	76
1946	232.5	100
1947	240.7	104
1948	244.3	105
1949	239.7	103
1950	260.9	112
1951	267.9	115
1952	264.3	114

(Continued on next page)

From this table the fact stands out that progress in raising our level of prosperity has been halting. What progress we have made came in a few dramatic increases before or after a military build-up. Aside from those, the progress has been fairly slow. This year, 1952, it has been particularly discouraging.

Again, when account is taken of the number of people who must share in the goods and services that are available, our progress is even less marked. This is shown by the following table which gives the share of the average American in the national product. This, as the table indicates, is arrived at simply by dividing the total of available goods and services by the population on hand to share in them.

YEAR	POPULATION Millions	ADJUSTED NATIONAL PRODUCT Billions 1951 Dollars	ADJUSTED NATIONAL PRODUCT Per Person
1940	132.0	$176.2	$1,335
1946	141.3	232.5	1,645
1947	144.0	240.7	1,672
1948	146.6	244.3	1,666
1949	149.2	239.7	1,607
1950	150.6	260.9	1,732
1951	154.4	267.9	1,735
1952	156.9	264.3	1,685

Here it is clear that we have made little or no headway since the end of World War II.

U.S. Compared to Other Nations

Although we are making slow progress in increasing our prosperity, as measured during recent years by the amount of goods per person, we still are by long odds the most prosperous people on earth. This can be seen from the following table. It offers a rough measure of how the adjusted output of goods and services per person in the United States compared in 1951 with that in a number of other countries:

COUNTRY	PER PERSON
United States	$1,735
Canada	1,231
United Kingdom	614
France	510

To figure more closely "How Prosperous is the U.S.A.?" we must answer a number of other questions. One of the most important will be the subject of a later editorial in this series. It is "Who Gets What?" How have various income classes and occupational groups shared the total available goods?

Another question that has a basic bearing on the quality and durability of our prosperity is "How fast are we using up irreplaceable natural resources, such as oil, iron ore, and copper, to sustain it?" Any attempt to deal with this very complicated question must also be deferred.

A Problem for the Future

In the meantime, however, key facts about our prosperity are that:

1. Most of the increase in the nation's total production in recent years has been to meet military requirements rather than to improve the American standard of living.

2. The increase in the supply of goods and services actually available for the average American has been slow and halting.

3. We Americans are still extremely well provided with the good material things of life, as compared with peoples in other lands.

These three facts bring to mind a whole series of policy questions. What can be done to speed up progress in improving our prosperity? What—to repeat the question discussed in the previous editorial in this series—can be done to make our prosperity less precarious?

Here, however, the purpose is not to prescribe. It is simply to indicate as accurately as it can be done in a brief article the actual state of the nation's prosperity.

In doing this much, it can properly be remarked that the record presents to the American economy both a problem and an opportunity of surpassing importance. It is that of building a prosperity that will be both more progressive and more secure than any we have known in recent years. In the light of what clearly remains to be done, we shall make a grave mistake if we use up any of our energy in congratulating ourselves on the relatively meager progress here recorded.

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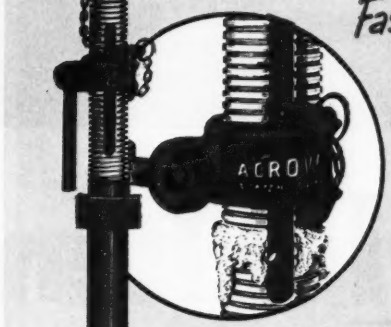

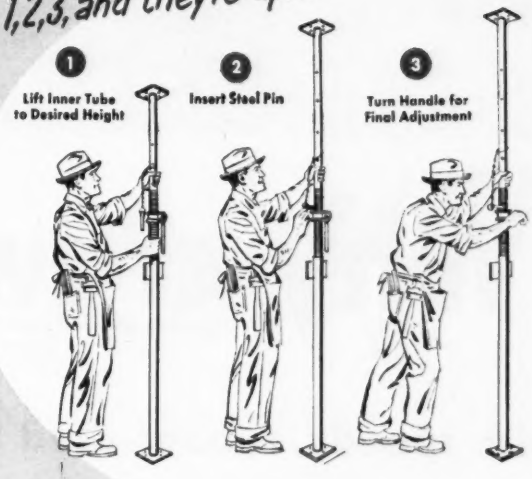

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Clears, grades land

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With crane, lifts up to 14 tons

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That's because he is skilled in adapting RAMSET tools, fasteners and other products into an integrated service to meet the specific requirements of the work. He is no "long-distance, white-collar operator"—but will put on his working clothes and show your men, right on the job, how to apply RAMSET SYSTEM to save you time and money.

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Latest RAMSET development, with 10-Star Values that bring new ease, speed, economy and utility. Light, compact, one-piece tool is easy to use, can work in tight corners or otherwise inaccessible locations. Ask your dealer for demonstration and proof of its money-saving advantages.

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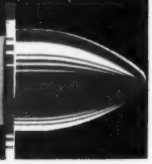
Ramset WITH TRU-SET FASTENERS



Legal Decisions Concerning Construction

A New York Indemnity

A NEW YORK BANK had sued a delinquent contractor, got judgment, and the cashier placed an execution in the sheriff's hands.

"Go ahead and levy on any property you can find that looks as if it belongs to him," the cashier ordered.

"I understand that his property is mostly in his wife's name, and I might get in trouble if I levied on the wrong stuff," the sheriff demurred.

"You go ahead and the bank will indemnify you against any claim for damages," the cashier agreed.

On the strength of this statement the sheriff made a levy, was forced to pay damages, and sued the bank on the cashier's promise.

"Giving an indemnity under these circumstances was beyond the usual powers of a bank cashier, and is not binding on us," the bank contended, and the New York Courts so ruled in the case of Watson *vs* Bennett, 12 Barb. N. Y 196.

The "Burden of Proof"

"WHAT'S THAT $1,000 charged on my passbook on 15th inst.?" the contractor demanded.

"That's a check of yours in favor of John Brown," the cashier told him.

"I never gave Brown a check for $1,000 nor for any other amount in my life," the contractor averred.

"Well, sue us for the amount, and prove that the check was a forgery."

"No—I'll sue and swear that I never gave him a check, and then the burden is on you to show that the check was genuine," the contractor maintained.

And the Illinois Courts ruled in the contractor's favor in Chicago Savings Bank *vs* Black, 126 App. 128.

Presentment and Certification

THE COURTS have ruled that if A gives the contractor a check, B requests the bank on which it is drawn to place it to his credit,

(Continued on page 132)

Cutting ditching hazards on the high seas and the highways

U·S·S AMERICAN MULTISAFTY CABLE GUARD

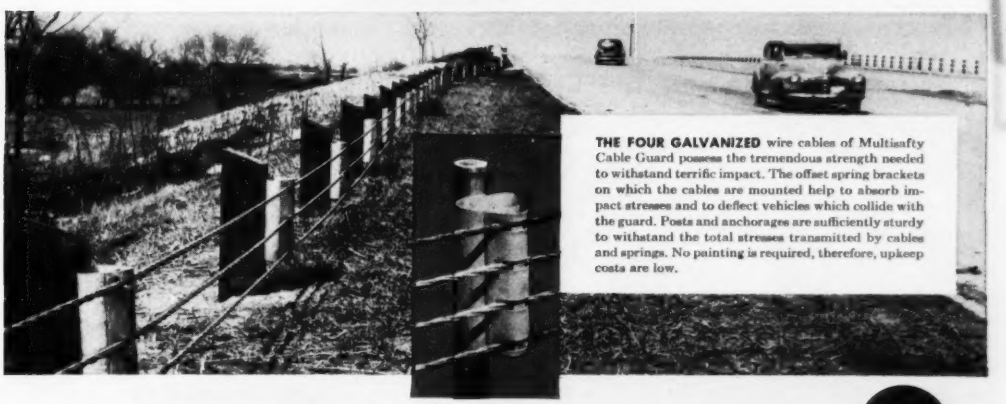
THE LANDING OFFICER can guide the pilot to the air-craft carrier's deck, but he cannot *stop* the plane. To do that, a hook, attached to or near the plane's tail must engage one of the galvanized wire cables mounted on spring brackets, which are stretched across the deck. The resiliency of the wire cable, plus the action of the spring bracket, absorbs the shock of the plane's forward speed, helps stop it promptly, safely. American Multisafty Cable has proved so long lasting, effective and economical that it is being widely used for this purpose by the United States Navy.

WHEN a pilot lands his fighter on a flattop, a system of wire cables, attached to spring brackets, prevents him from "ditching" at the other end of the ship. And when a motorist goes off the road on a properly protected highway, a system of wire cables, attached to resilient brackets, can be designed to properly deflect the car even though the guard rail is hit at high speeds.

That is why Multisafty Cable Guard has been adopted as a standard material by many state highway commissions. The four galvanized wire cables, attached to galvanized spring brackets, absorb the impact of collision and sideswiping, prevent off-the-road crashes and capsizing of speeding cars.

Multisafty Cable Guard has been developed from many tests made at our Worcester, Massachusetts proving grounds where various guard rails were hit by automobiles at high speeds. Stresses in the rail were measured at time of impact. From these tests, data are now available to arrive at a rational method of designing highway guard for *definite miles per hour protection.*

When you are considering high-grade low-cost protection for highway traffic in your area, drop a line to our nearest sales office for complete information on Multisafty Cable Guard and for literature containing information on how to design a guard rail for *definite miles per hour protection.*



THE FOUR GALVANIZED wire cables of Multisafty Cable Guard possess the tremendous strength needed to withstand terrific impact. The offset spring brackets on which the cables are mounted help to absorb impact stresses and to deflect vehicles which collide with the guard. Posts and anchorages are sufficiently sturdy to withstand the total stresses transmitted by cables and springs. No painting is required, therefore, upkeep costs are low.

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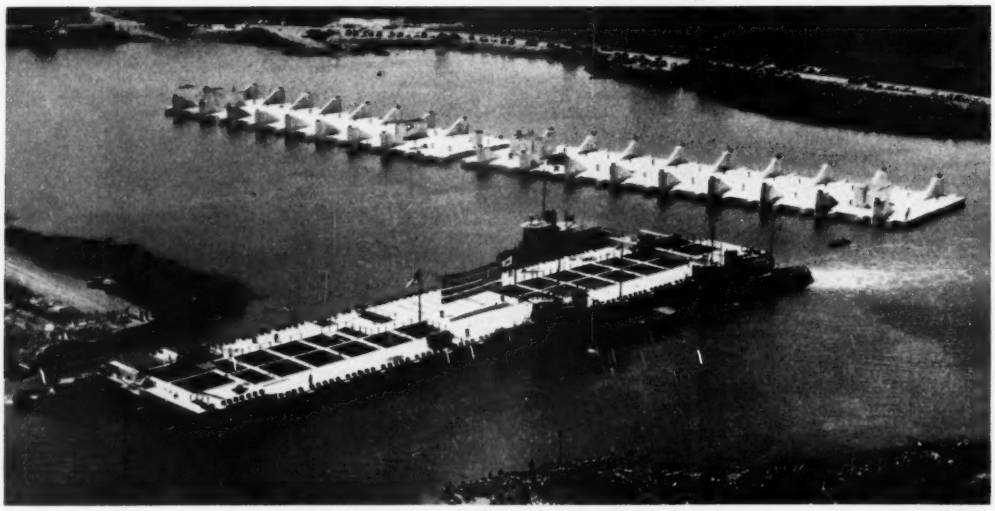
For New York's Amazing Pier 57



First section of Pier 57 starts its 38-mile trip down the Hudson River. More than 50,000 barrels of Lehigh Cements are being used in the construction of the pier.

Owner: **City of New York, Dept. of Marine & Aviation**
Consulting Engrs.: **Madigan-Hyland, New York**
Contractors: **Merritt-Chapman & Scott Corp. and Corbetta Construction Company**
Ready Mixed Concrete: **Colonial Sand & Stone Co.**
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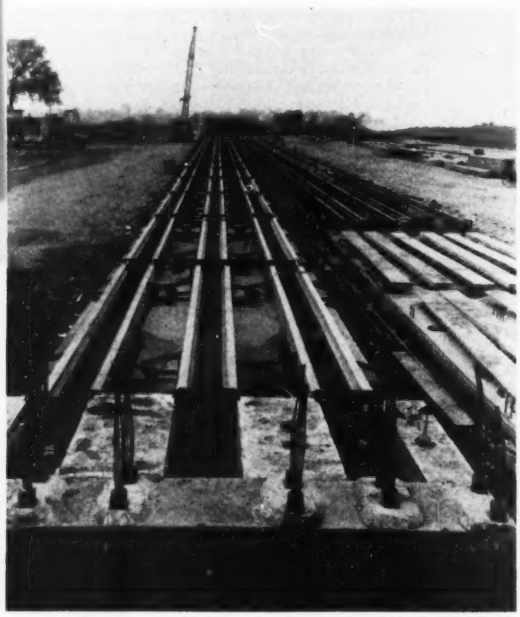
Prestressed Concrete Stringers made with LEHIGH EARLY STRENGTH CEMENT



Prestressed Stringer bed ready for concrete. This is one of four, each consisting of a 5" slab, 10' wide, 384' long. Side forms were made of concrete instead of wood for faster stripping and resetting.

Prestressed concrete has taken another step forward. Now it has been used for the 3300 main deck stringers of New York's new Pier 57, as the most practical and economical concrete design for the extraordinary load requirements.

In casting the stringers, Corbetta Construction Company used mass production methods and Lehigh Early Strength Cement. Their operational cycle called for setting forms, prestressing and pouring 48 stringers on one of four casting beds each day. Stringers were removed and forms re-used on the fourth day after each pour.

Without the use of Lehigh Early Strength Cement, more than twice as many casting beds would have been needed . . . more than twice as many concrete side forms.

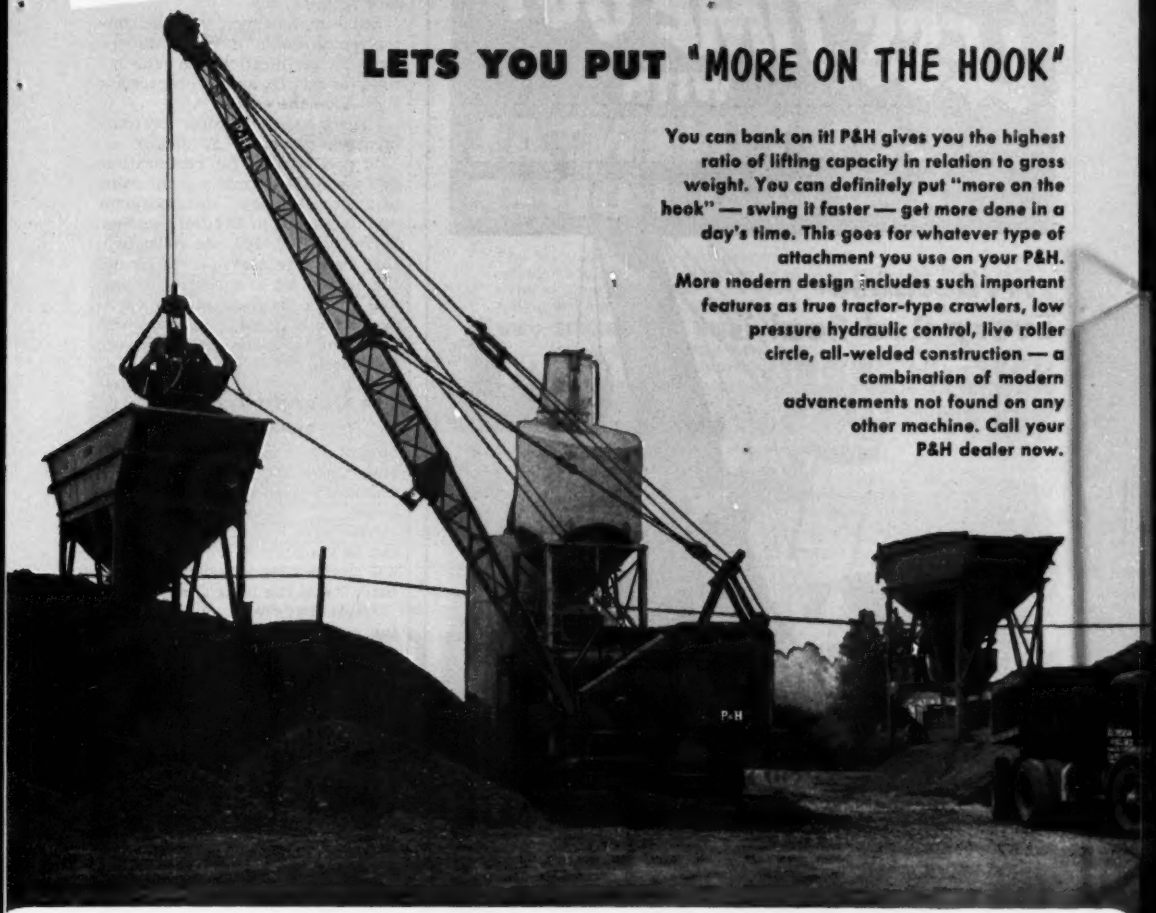
This is another example of the advantages of Lehigh Early Strength Cement in modern concrete construction methods.

LEHIGH PORTLAND CEMENT COMPANY, Allentown, Pa., Chicago, Ill., Spokane, Wash.

Lehigh CEMENT

P&H STABILITY

LETS YOU PUT "MORE ON THE HOOK"



You can bank on it! P&H gives you the highest ratio of lifting capacity in relation to gross weight. You can definitely put "more on the hook" — swing it faster — get more done in a day's time. This goes for whatever type of attachment you use on your P&H. More modern design includes such important features as true tractor-type crawlers, low pressure hydraulic control, live roller circle, all-welded construction — a combination of modern advancements not found on any other machine. Call your P&H dealer now.

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P&H Power Shovels and Truck Cranes are more easily converted for various types of service because hoist and digging drums are on one shaft. The need for auxiliary shafts and gearing is eliminated. Write for literature on the size you need. Sizes up to 8 cu. yds., gasoline, diesel or electric power.

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....Because Every Red Seal is ENGINEERED TO ITS WORK
CONTINENTAL MOTORS
Powerful as the Nation
AMERICA'S STANDARD
PARTS AND SERVICE EVERYWHERE
Continental Motors Corporation
MUSKEGON, MICHIGAN

LEGAL DECISIONS . . .

Continued from page 128

which the bank refuses. This is equivalent to a demand of payment, and gives the contractor a right of action against A for the face of the check.

Suppose, however, that the contractor presents a check to the bank for certification, the bank refuses to certify, and the contractor sues A on the check.

"There was no proper presentment for payment," A alleges.

"I presented it for certification, and a refusal to certify is the same as a refusal to pay," the contractor maintains, but in Bradford *vs* Fox, 59 Barb. N. Y. 203, the court held that a mere refusal to certify is not the equivalent of a refusal to pay, and that a presentment for certification only is not a sufficient presentment to charge the maker of the check.

The Georgia Transfer

A GEORGIA CONTRACTOR bought stock in a Georgia bank, and the bank refused to make the necessary transfer on the bank books.

"We have a bylaw that no stock can be transferred while the original stockholder is indebted to the bank," was the bank's excuse.

"And that's your only reason?" the contractor demanded.

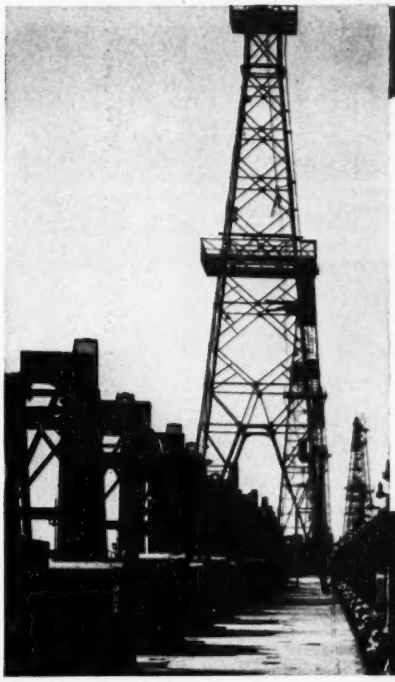
"Yes—and reason enough," the bank told him, and the contractor sued the bank.

"No demand for a transfer was made at our principal office, as stated on the certificate," the bank objected when the case came to trial.

"You refuse solely on a different ground, and now you're too late with this new objection," the contractor demurred, and the Georgia Courts ruled in his favor in Montrose Banking Co. *vs* Ford reported in 118 S. E. 756.

Costly Cave-ins

CAVE-IN ACCIDENTS continue to make news, in spite of national construction safety efforts. Walter Parr, owner of the Parr Construction Co., and his brother-in-law, Ernest Weller, recently were working at the bottom of a 20-ft sewer trench in New Jersey when 8 ft of clay slid down fatally injuring both. In New York, the 26-yr-old widow of Matthew Jamison was awarded $70,000 by a jury after his death caused by a caving bank.



for tough jobs like this— choose WICO XHD Magnetos

Each of the more than 250 engines in this mile-long row runs 24 hours every day of the year, with only brief monthly service, at Huntington Beach, California. Week after week, they're exposed to salt air from the Pacific Ocean just 300 feet away.

Ignition *has* to be rugged to stand up in this service. That's why the company has used Wico for over 12 years . . . and why they're now standardizing on Buda engines factory-equipped with Wico XHD heavy duty magnetos.

Features like these make the XHD the leading choice for severe field conditions:

- Weatherproof coil jacketed in heavy plastic
- One-piece cast rotor
- Big tungsten breaker contacts
- Extra-heavy vibration-proof construction
- Factory lubricated bearings

The Wico XHD comes with base or flange mounting, for four or six cylinder engines. Get full details from your equipment dealer. And write to us for the address of the nearest of the more than 2000 Wico Authorized Service Stations.

WICO ELECTRIC CO., WEST SPRINGFIELD, MASSACHUSETTS

Manufacturers of Wico "Autostop" and the "Puff-A-Lite" Automobile Lighter

HY-LO SAYS . . . HERE'S THE

HOTTEST BUY

IN OIL-BURNING SALAMANDERS

IT'S A FACT . . . The HY-LO Salamander produces the greatest amount of radiant heat and requires less cleaning and attention than any other salamander on the market!

Look at these BIG HY-LO advantages:

- FREEDOM FROM CLEANING . . . exclusive return pipe principle results in almost perfect combustion. HY-LO consumes its own soot in the bowl.
- LOW OPERATING COST . . . easily produces 140,000 BTU per hour of clean heat, burning low-cost fuel.
- TROUBLE-FREE OPERATION . . . no wicks, jets, valves or gadgets and no hoses, pipes or fuel under pressure.
- SIMPLICITY ITSELF . . . lights with a match and burns 10 to 20 hours on one filling.
- EXCLUSIVE DAMPER for quick, easy extinguishing.
- IDEAL FOR ALL SPOT AND EMERGENCY HEATING NEEDS, inside or out-of-doors.

HY-LO Oil-Burning Salamander

Height 62-3/4"

Diameter of bowl—19"

Weight—26 lbs.

Patent No. 2284157

Wire or write for name of nearest HY-LO distributor.

SCHEU PRODUCTS COMPANY

290 STOWELL ST. UPLAND, CALIF.

SALES AND ★ SERVICE ★

News of manufacturers' activities designed to assist the reader in the purchase of machinery, equipment and materials and help him obtain quick service on parts and maintenance.

Distributor Appointments

Euclid Road Machinery Co.: Appointment of Philpott Equipment Co. of Seattle as distributor of Euclid earth-moving equipment for the western half of Washington State and Alaska has been announced.

Davey Compressor Co.: Announcement was made recently of the appointment of 7 new distributors to handle the entire Davey line which includes portable and stationary compressors (60 to 315 cfm); "Auto-Air" (truck-mounted) compressors; field service units, mobile machine shops and heavy-duty truck power take-offs. Equipment Rental & Sales Corp., 1211 S. Fifth St., Minneapolis, Minn., will handle the southern half of Minnesota; Clark County Wholesale Mercantile Co., Inc., 512 S. Main St., Las Vegas, Nev., the southeastern section of Nevada; New Mexico Equipment Co., 701 E. Coal St., Albuquerque, N. M., will cover New Mexico; Bradley Industrial Supply Co., 328 E. Third St., Borger, Tex., the Texas Panhandle; Baker Equipment Engineering Co., Summit and Norfolk Sts., Richmond, Va., will handle Virginia, North Carolina and South Carolina; The Stanco Co., 1914 Canton St., Dallas, Tex., will operate in Texas, Louisiana and Kansas; San Antonio Equipment Co., 661 Main Ave., San Antonio, Tex., will cover South-Central Texas.

Cleco Div., Reed Roller Bit Co.: Has announced the appointment of Anna M. Fusco, DBA, S. L. Fusco, 4937 E. Olympic Blvd., Los Angeles 22, Calif.; Pauli and Griffin Co., 509 Sixth St., San Francisco, Calif.; William J. Boss Co., Glens Falls, N. Y.; and Bison Machinery & Tool Co., 709 Seneca St., Buffalo 10, N. Y., as distributors for Cleco products in their areas.

Cleaver-Brooks Co.: Has appointed the Western Traction Co., 2230 Third St., San Francisco 7, Calif., as northern California distributor for its Road Machinery Division.

On the Sales Front

Gardner-Denver Co.: Announced the appointment of Robert G. Caldwell as district manager of the company's branch office in Atlanta, Ga. Mr. Caldwell succeeds H. G. Little who has bought an interest in the Central Machinery Co. of Miami, Fla., a Gardner-Denver distributor.

B. F. Goodrich Co.: Richard T. Bules has been appointed manager, V-Belt Sales, industrial products sales department, succeeding George J. Fischer who resigned recently.

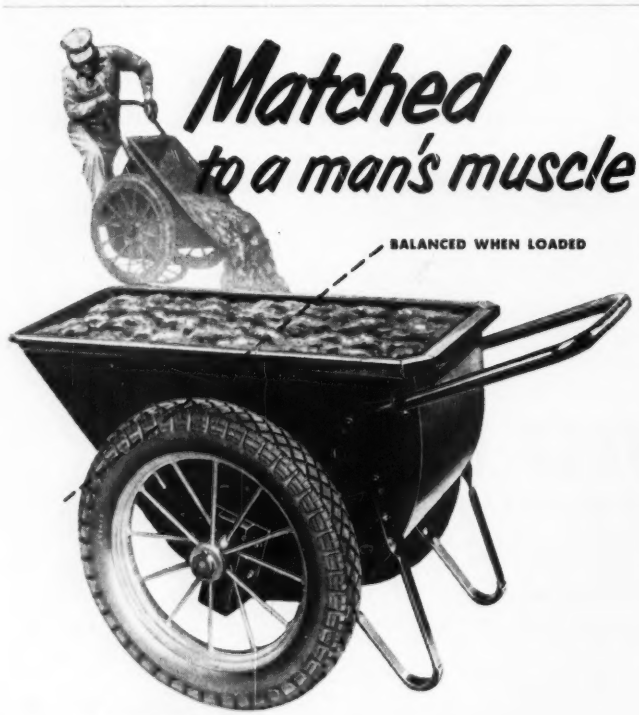
Boston Woven Hose & Rubber Co.: The promotion of H. S. Johnson to director of merchandising, L. M. Atwood to assistant general sales manager and J. H. Alsen to director of Engineering Applications was announced recently.

Cummins Engine Co., Inc.: The appointment of C. R. Boll, Jr., to the position of general sales manager, to be responsible for engine, parts and contract sales, the company regional organization, advertising and sales development, has been announced.

Alloy Rods Co.: Alfred K. Althouse and Richard James, III, have joined the company as field representatives. Mr. Althouse will make his headquarters in Philadelphia; Mr. James in Cleveland.

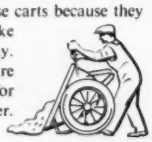
W. A. Riddell Corp.: Has appointed Bruce W. Goodspeed factory representative in the southeastern states

(Continued on page 138)



GAR-BRO concrete carts

LET A MAN HANDLE ALL HE IS ABLE . . . and he can handle up to 8 cu. ft. when the load is perfectly balanced. A Gar-Bro cart balances a full load; lets a man devote his entire energy to pushing. Men like these carts because they are lighter and easier to handle; are less tiring. You'll like them too, because your men move more concrete per day. There are two sizes, 6 and 8 cu. ft. capacity. Tires are heavy duty pneumatic, or steel. A rocker attachment for easy dumping is available. Write for name of local dealer.



EQUIPMENT GAR-BRO ENGINEERING SERVICE

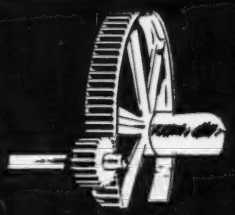
GAR-BRO MANUFACTURING COMPANY
2415 EAST WASHINGTON BLVD., LOS ANGELES 21, CALIFORNIA
for faster concrete handling

Amscoating

The Right Way to Say Hard-facing for every Industrial Use

AMSCO TOOLFACE for metal to metal wear up to 1000° F. Deposits have high abrasion and impact resistance. All diameters bare and coated. Microstructure: martensitic steel.

AMSCO TUBE TUNGSITE (coarse particles) is best suited for applications requiring highly efficient cutting qualities, for hardfacing earth working and drilling equipment used for cutting extremely hard compositions, for hardfacing applications requiring a serrated edge and hard-facing certain types of earth working equipment or parts subject to extreme abrasion.



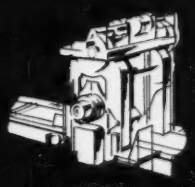
AMSCO HF-60 for moderate impact and abrasion and has outstanding weldability particularly for vertical applications. All diameters, coated only. Microstructure: martensitic steel.

AMSCO FARMFACE or AMSCO CHROMEFACE for farm or industrial use. Excellent resistance to low stress sliding abrasion. All diameters, bare and coated. Microstructure: a high chromium austentitic iron containing manganese and silicon, and consisting of hard chromium carbides in a matrix of austenite.

AMSCO No. 217 for abrasive service up to 1000 F. All diameters, bare and coated. Microstructure: an air hardening martensitic iron alloy containing chromium and tungsten.

AMSCO HF-40 for severe abrasion, moderate impact. Deposits have excellent weldability. All diameters, coated only. Microstructure: martensitic cast iron.

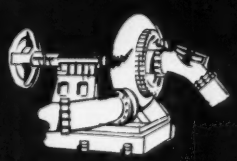
AMSCO AIR-HARDENING for abrasion and severe impact. Deposit can be forged to sharp edge without loss of hardness. All diameters, bare and coated. Microstructure: martensitic steel.



AMSCO AW-79 will meet most requirements for better control of wear where abrasion and impact are important factors—plus all the advantages of automatic welding. Especially suitable for rebuilding and hardfacing tractor rollers, steel wheels, sheeting rolls, dredge pins, as well as dozens of other automatic applications. $\frac{5}{32}$" and $\frac{3}{16}$" in 22½" ID., 100 lb. coils.

AMSCO V-MANG, bare or coated, for build up and repair on manganese steel castings exposed to impact; work hardens—$\frac{5}{32}$", $\frac{3}{16}$", ¼". Microstructure: austenitic manganese steel.

AMSCO CO-MANG, coated only, for build up and repair of manganese steel castings exposed to severe impact. Deposit has excellent impact resistance; work hardens—⅛", $\frac{5}{32}$", $\frac{3}{16}$", ¼". Microstructure: austenitic manganese steel.



AMSCO TUNGROD (fine particles) is best suited for applications requiring highly efficient cutting qualities, for hardfacing earth working and drilling equipment used for cutting extremely hard surfaces or formations, for hardfacing applications requiring a thin edge or small point, for hardfacing certain types of equipment or parts subject to extreme abrasion.

AMSCO ECONOMY HARDFACE "C" for abrasion resistant service and severe impact. All diameters, coated only. Microstructure: martensitic steel.

AMSCO No. 1 and AMSCO No. 6 for combination of corrosion and abrasion or for 1000° F service and above. No. 1 has greater abrasion resistance; No. 6 is tougher and can be machined. All diameters, bare and coated. Microstructures: No. 6 contains an eutectic carbide mixture in a solid solution matrix, while No. 1 contains large hard wear-resistant chromium carbide crystals scattered through a solid solution matrix.

AMSCO No. 459 for severe abrasion, mild impact. Excellent abrasion resistance. All diameters, bare and coated. Microstructure: martensitic cast iron containing chromium and molybdenum, consisting of hard carbides, austenite and martensite.

To get the right answer, detailed analyses, and other pertinent information, concerning your wear problem, write for catalog 650W or contact your nearest Amsco Distributor.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION

385 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

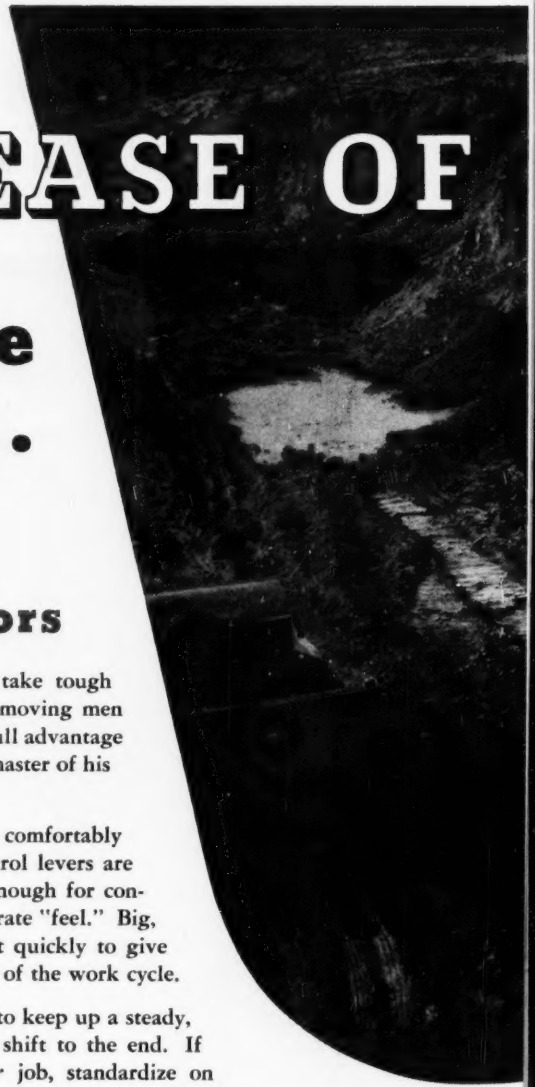
Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que. Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

Now . . . . EASE OF

counts more than ever...

and it's yours with

BUCYRUS ERIE **excavators**



Speed, smooth operation and unmatched ability to take tough going have made Bucyrus-Eries a favorite with earth-moving men everywhere. And all these qualities can be applied to full advantage on every job because a Bucyrus-Erie operator is really master of his machine.

First, he has plenty of space to move freely and comfortably . . . with full visibility of his work at all times. Control levers are grouped within easy reach, with lever throws short enough for convenience . . . but long enough to give the operator accurate "feel." Big, slow speed clutches and brakes respond smoothly, yet quickly to give him constant, direct control of the load every moment of the work cycle.

With direct-action control, it's easy for operators to keep up a steady, production-building pace from the beginning of the shift to the end. If that's the kind of performance you'd like on *your* job, standardize on Bucyrus-Erie.

70E52C

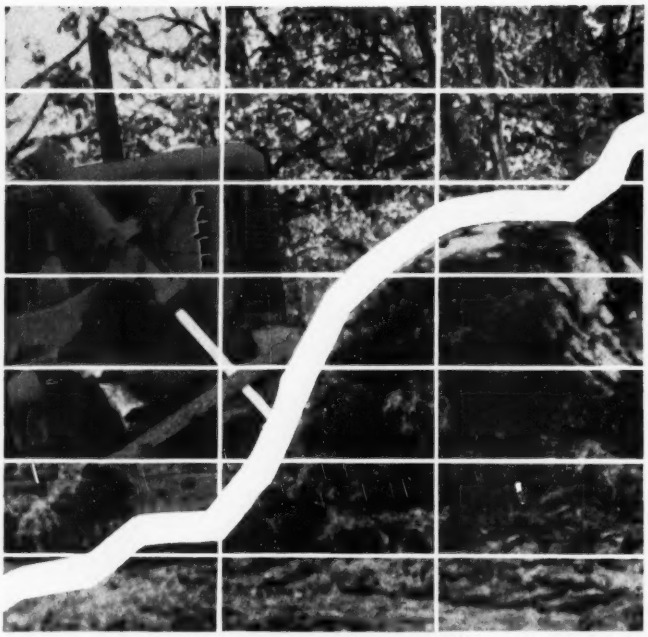
BUCYRUS-ERIE

SOUTH MILWAUKEE, WISCONSIN

Most Compared . . . Most Preferred

Save time... Save money... with the Bucyrus-Erie Hydrocrane

The compact, truck-mounted Hydrocrane handles an almost endless variety of jobs efficiently, at low cost. Full hydraulic control . . . pin-point accuracy . . . telescoping boom . . . easily set, hydraulically operated outriggers . . . and it's readily convertible in the field to dragshovel front-end, called Hydrohoe.



Designed with the *Profit Curve* in mind...!

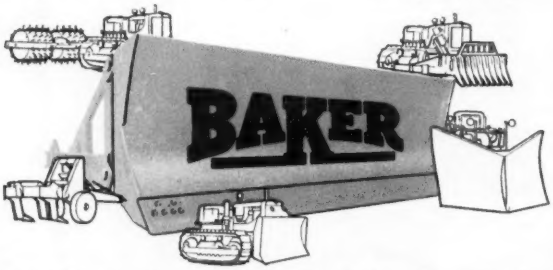
Baker Blades have the *maximum* "ROLL-ACTION"—from cutting edge to mold-board top, they're scientifically contoured to roll the load *with minimum resistance.* Thus you get more push from your investment in horse-power—bigger pay-loads from Baker's advanced DESIGN-FOR-PROFIT curve.

Add Baker's job-proved positive down-pressure to "ROLL-ACTION"—plus Baker *fingertip control* and *quick direct-lift*—and you have concrete reasons why more buyers are saying, "I want an A-C with a *Baker* Blade."

Baker Bulldozers, Gradebuilders and Root Rippers—available in engine-mounted hydraulic, frame-mounted hydraulic (the new no-pushbeam 9-X), and cable-controlled units—featuring easy interchangeability—are designed exclusively for the Allis-Chalmers crawler line.

Ask your Baker, A-C Dealer to come out now—get the *complete* facts.

THE BAKER MANUFACTURING COMPANY
Springfield, Illinois



Baker—The *most versatile* line of tractor attachments

SALES AND SERVICE . . .

Continued from page 134

to work closely with distributors and owners of WARCO motor graders, both the 4D-100, 100-hp model, and the new 4D-85, 85-hp model.

Bendix Radio Div., Bendix Aviation Corp.: Lawrence J. Straw has been named Mobile Sales Manager. In this capacity he will head up a newly created national sales engineering organization, selling the Bendix line of two-way radio and communications systems.

Quaker Rubber Corp., Div. of H. K. Porter Co., Inc.: William M. Taylor has been named manager, Export Department. Mr. Taylor has been merchandising manager at Quaker and will continue his duties in the department as well.

Pierce Governor Co., Inc.: Recently announced the appointment of Lionel B. Hakes as vice-president in charge of sales.

Detroit Diesel Engine Div., General Motors Corp.: The appointment of two zone sales representatives has been announced. Eugene K. Cook and William R. Bays will supervise distributor and dealer sales in two midwestern zones with headquarters respectively in Detroit, Mich., and Lincoln, Neb.

White Motor Co.: H. R. Stickel has been named assistant to the president, in charge of public relations and national fleet sales.

Pioneer Engineering Works: J. Miller Brown, sales engineer for the company in the southwest states since 1946, has been appointed export manager.

Syntron Co.: The opening of new offices for the Syntron Birmingham Sales Co. at 1831 29th Ave. S., Birmingham 9, Ala., has been announced. Sales operations are under the direction of A. H. Brush.

Harnischfeger Corp.: Opening of a large new sales office, warehouse and service station in Birmingham, Ala., has been announced. Ray M. Calkins, formerly district manager in Memphis, is in charge of the new plant and territory.

Pipe Linings, Inc.: Has announced the appointment of A. J. Gates as southwestern representative with headquarters in Ruidoso, N. M.

Boston Woven Hose and Rubber Co.: The promotion of Whiting N. Sheppard to director of sales was announced recently.

Air Reduction Sales Co.: The appointment of new managers at Boston and Pittsburgh has been

(Continued on page 140)

LOOK! Joe...I made this cut with my Clipper in 17 seconds!

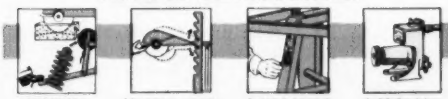
MODEL HD
One of NINE Models
from $265

Yes...

CUT ANY MASONRY MATERIAL EASIER, FASTER with a NEW CLIPPER MASONRY SAW

Yes, you can slice through the hardest materials in seconds with a CLIPPER MASONRY SAW. Smoother, faster cutting action than ever before. Contractors agree on the new WET or DRY cutting MODEL HD for the 100% Answer to ALL masonry cutting problems. Actually the HD is "4 SAWS in 1"—it will meet your DUSTLESS cutting requirements in confined areas, it will cut DRY for outside operations, it can be "CONVERTED" to a (Light Duty) *Concrete Saw* and a *Track Saw!* Yes, now greater profits than ever before with a "CONVERTIBLE" Clipper Masonry Saw!

PATENTED CLIPPER FEATURES



PRESSURE EQUALIZER | SELECT-A-NOTCH | SAVE-A-BLADE DIAL | WET-OR-DRY PUMP

With a Clipper on the job masonry cutting is easy . . . just place the material on Conveyor Cart . . . the *SELECT-A-NOTCH* instantly sets cutting head for material size. A quick setting of the *Save-A-Blade Dial* and the *Pressure Equalizer Spring* automatically cushions the blade for faster cutting —longer life. During DUSTLESS cutting the *WET-or-DRY PUMP* delivers the exact flow of water and when switching to Dry cutting the belts need not be disconnected.

. . . NOW YOUR CLIPPER IS "CONVERTIBLE"!

① DRY-Masonry Saw

At any time the cutting head of your Model HD Clipper can be placed on the "CONVERTIBLE" CART...you're ready to saw concrete or asphalt patches or trenches. No more fractures beyond removal lines—no spalling! But there's more ...just set the CART on TRACKS and operate as a TRACK SAW on stone slabs. The Clipper "CONVERTIBLE" is an exclusive Clipper design.

② WET-Masonry Saw

Light Duty CONCRETE Saw ③

④ TRACK Saw

4 SAWS IN 1

Sold on FREE TRIAL!

Order TODAY on FREE TRIAL. Discover for yourself how Clipper will increase production . . . cut costs . . . increase profits. Only through the Clipper FREE TRIAL are you guaranteed . . . ACTUAL TEST on the job . . . FULL SATISFACTION . . . NO OBLIGATION!

Clipper

KANSAS CITY 8, MISSOURI

PITTSBURGH, ST. LOUIS, CLEVELAND, INDIANAPOLIS, DETROIT, HOUSTON, AUSTIN, TEX., CHICAGO, LOS ANGELES, PHILADELPHIA, SAN FRANCISCO, CINCINNATI, NEW YORK, ATLANTA, WASHINGTON, D.C., BOSTON, BIRMINGHAM, KANSAS CITY

"COAST-TO-COAST"

GENUINE CLIPPER BLADES - ALL DIAMETERS

DRY-WET & B-R BLADES

DIAMOND BLADES

MAIL THE COUPON TODAY!

Serving the World as the World's Largest Manufacturer of Masonry Saws

CLIPPER MANUFACTURING COMPANY
2809 N.W. WARWICK • KANSAS CITY 8, MO.

Send FREE Information and Literature on:

☐ NEW CLIPPER MASONRY SAWS ☐ CLIPPER CONCRETE SAW
☐ DUSTLESS Model HD ☐ FREE TRIAL 91

NAME _____

ADDRESS _____

CITY _____ STATE _____

SOLD ONLY DIRECT FROM FACTORY

BALANCED FOR EASY WHEELING!

Equipped with steel wheel or wheel with zero pressure or pneumatic tire.

You'll find it so easy to wheel heavy loads in Sterling Barrows. Only a minimum of effort is required. Sterling's perfectly balanced construction permits 80% of the load to be carried on the wheel . . . only 20% by the operator. This increases efficiency . . . allows more loads to be hauled each day . . . reduces hauling costs.

ORDER NOW!

DEALER PLAN AVAILABLE. WRITE FOR DETAILS.

Model C5W with Pneumatic Tired Wheel and Wood Frame.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

● ***READY FOR YOU . . .***

REPRINTS ON

EARTHMOVING

The first comprehensive book on this important subject ever published

The series of articles entitled "Earthmoving . . . An Art and a Science", published in Construction Methods and Equipment during 1951 and 1952, has been assembled under one cover to satisfy the scores of requests for such a book. Extra copies are available.

Here are 64 pages of valuable excavating and earthmoving data, prepared by authorities in their field, useful to contractors, estimators, foremen and operators for years to come.

CONSTRUCTION
METHODS AND EQUIPMENT
330 West 42nd Street, New York 36, N. Y.

PRICE
50¢
10 copies or more
35¢
each
Please remit with order to reduce our handling costs

SALES AND SERVICE . . .

Continued from page 138

announced. A. S. Blodget, Jr., who was manager of the Boston district, becomes manager at Pittsburgh. E. S. Twining, Jr., formerly assistant sales manager of the Philadelphia district, succeeds Mr. Blodget as manager of the Boston district.

Republic Rubber Div., Lee Rubber & Tire Corp.: Wayne H. Hunter has been appointed Assistant Sales Development Manager to assist in the advertising, sales promotion and sales training phases of merchandising Republic's line of belting, hose, packing and molded rubber products.

Alloy Rods Co.: Advancement of F. L. Blodgett from the post of manager of the Hard-Facing Division to assistant general sales manager of the company has been announced.

Rockbit Sales and Service Co.: Announces the appointment of Joe Klemeyer as general manager and Wayne Burnside as sales manager.

Brunner & Lay, Inc.: E. A. Bowman, formerly sales representative for the central states, has been appointed to the position of sales manager.

Sterling Engine Co.: George D. Thomas has been appointed to the Application Engineering field sales staff. Internationally known for his work in the field of electric power generation, the services of Mr. Thomas will now be available to all Sterling customers.

Cook Bros. Equipment Co.: Recently announced the formation of a new division to handle its Series "MC" Trucks, which are designed and engineered as crane and shovel carriers. This new division will be known as the Crane and Shovel Equipment Division with Robert H. Fox as sales director.

Templeton, Kenly & Co.: Consolidation of the New York Domestic and Export offices has been announced. E. A. Zimmerman will direct both operations in new quarters at 60 E. 42nd St., Rm. 2119, New York 17, N. Y.

Davey Compressor Co.: N. C. Hays has been named west central district manager in charge of company operations in New Mexico, Arizona, Utah, Colorado, Wyoming Idaho, Montana, the Las Vegas, Nev., trading area and the provinces of Saskatchewan and Alberta, Canada.

Cummins Engine Co., Inc.: C. B. "Charlie" Foster has been appointed to the newly created position of Sales Manager—Engines. In his new capacity, Mr. Foster will continue to be in charge of all Government contract

(Continued on page 142)

FORD TRUCK ECONOMY RUN

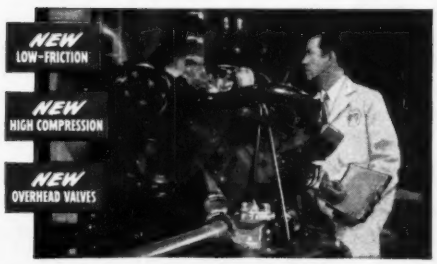
CALIFORNIA
Report No. 11300

This F-8 BIG JOB mounts a 10-yd. Anthony dump body. There's a Ford Truck built to meet *your* requirements.

"I truck 12-ton loads of sand, yet my running costs are Only 3⅘¢ a mile"

says Charles Laws, Concord, California

"I've had experience with many makes of trucks," says Mr. Laws, "but none of them cost as little to run as my Ford. It saves gas and gives me more speed-hauling power, too." During the Economy Run, Mr. Laws' F-8 trucked 12-ton loads of washed sand 8,118 miles. Yet running expenses for gas, oil and service (but not including fixed expenses, such as, taxes, license, insurance, depreciation, etc.) totaled $297.59. That's a running cost of just 3⅘ cents a mile!



Two years of testing show how well the new Ford LOW-FRICTION engines perform under the most severe conditions. They passed scores of 100-hour "destruction" tests. One model alone ran as much as 50,000 dynamometer test-hours, over 500,000 vehicle test-miles.

Now! Up to 14% more Gas Savings

and more Speed Hauling power, too!

New LOW-FRICTION design in three Ford Truck engines means more miles per gallon. New direct-breathing OVERHEAD VALVES give more efficient fuel-feeding. New HIGH COMPRESSION offers more power on regular gas. Choose from 5 great engines: new 101-h.p. COST CLIPPER SIX; famous 106-h.p. V-8; proved 112-h.p. BIG SIX; two new CARGO KING V-8's developing 145 h.p. and 155 h.p.

DON'T GUESS! See how little it can cost to run a truck in your kind of work. See the cost figures in this 144-page book showing results from the 50-million-mile Ford Truck Economy Run. See it at your Ford Dealer's!

Availability of equipment, accessories and trim as illustrated is dependent on material supply conditions!

FORD TRUCKING COSTS LESS

. . . FORD TRUCKS LAST LONGER!

Using latest registration data on 8,069,000 trucks, life insurance experts prove Ford Trucks last longer!

—FREE! MAIL THIS COUPON NOW!—

FORD Division of FORD MOTOR COMPANY
3250 Schaefer Rd., Dearborn, Mich.

Please send me without charge or obligation, complete details on the new Ford Trucks for '52 and the five great Ford Truck engines!

FULL LINE ☐ HEAVY-DUTY MODELS ☐
LIGHT MODELS ☐ EXTRA HEAVY-DUTY MODELS ☐

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. . . bring Production Speed to
BUSTING Concrete, CUTTING Asphalt
DIGGING Shale, TAMPING Backfill

SYNTRON

Gasoline Hammer

PAVING BREAKERS

—bust more concrete, cut more asphalt paving, dig more shale, tamp more backfill—better and faster than by laborious hand methods, with the Syntron PB-51 Paving Breaker.

Its more than 2000 fracturing blows per minute with the explosive energy of gasoline and new, heavy piston that adds 50% more fracturing power to each blow, reduce job-time and job fatigue.

100% Self Contained

No expensive Air Compressor, Hose and Accessories

No Batteries to run down

No Springs to fatigue and break

Can be operated by any one workman, no crew necessary. Ruggedly constructed and extremely portable.

Also available
SYNTRON
Self Contained
ROCK DRILLS
for fast, easy drilling in rock

Low Operating Cost—consumes about 2 qts. low test fuel per hour under continuous running.

You can save money and time with Syntron Gasoline Hammers—it will pay you to investigate.

Write Now For Your Free Copy
SYNTRON GASOLINE HAMMER CATALOG FOLDER

SYNTRON COMPANY
500 Lexington Avenue Homer City, Penna.

SALES AND SERVICE . . .

Continued from page 140

work and, in addition, will take over the duties of the former position of Manager—Engine Sales.

Harnischfeger Corp.: Don E Sweeney, formerly associated with General Motors Corp., is the new sales manager of P&H's Diesel Engine Division, Crystal Lake, Ill., succeeding R. H. Fitz.

Baldwin-Lime-Hamilton Corp.: A. D. "A1" Bellows, formerly crusher sales engineer for the Austin-Western Co., has been appointed sales manager, Crusher Department, Construction Equipment Division.

In the Main Office

Thermoid Co.: George S. Fabel, formerly vice-president, has been elected president to succeed Fred E. Schluter who remains on the Board of Directors. T. J. (Tom) Ellis has been elected a vice-president.

The Upson Co.: Announces that Kenneth A. Boos, formerly assistant secretary and assistant treasurer, has been elected treasurer, and James J. Upson, executive vice-president and secretary, has been named to the Board of Directors.

Macwhyte Co.: Has appointed E. C. Berg as vice-president and controller and G. Johnston, treasurer and assistant secretary.

Joseph T. Ryerson & Son, Inc.: William K. Underhill, former sales manager of the New York steel service plant, has been appointed assistant plant manager.

Cummins Engine Co., Inc.: E. D. "Don" Tull has been named to the newly created position of vice-president and general manager.

Special Mention

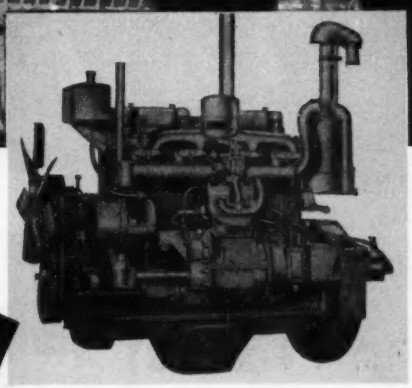
Westinghouse Air Brake Co.: Has purchased a majority interest in Le Roi Co. It is intended to retain the name, organization, officers, employees, plant locations and operations of Le Roi.

H. K. Porter Co., Inc.: Has acquired the Watson-Stillman Co., Roselle, N. J., manufacturers of forged steel fittings and hydraulic equipment. Operations will continue under the direction of Edwin A. Stillman, president.

Caterpillar Tractor Co.: Has announced the execution of a long-term lease for a warehouse and parts processing plant to be erected on land immediately adjacent to the company's new plant site at York, Pa.

(Continued on page 146)

HYSTAWAY®
Excavator-Crane
WITH
HEAVY-DUTY CATERPILLAR DIESEL TRACTOR ENGINE



On comparable jobs, the machine with the most power and the ability to deliver it will move the most dirt.

The Hystaway's power source is the rugged, heavy-duty engine of the Caterpillar diesel tractor on which it is mounted. Not only is this power source far greater than any other half-yard excavating machine—the Hystaway is specifically engineered to convert this tremendous diesel power into higher digging efficiency. See chart below for comparison of engine sizes.

Hystaway On-Tractor Model	Caterpillar Diesel Engine H.P. (Belt)	Other ½-Yard Shovels (H.P.)
D8	148	55*
D7	93	55*
D6	76	55*

*Figure shown is average for 15 half-yard machines surveyed. Most powerful published rating of the machines surveyed is 67 H.P.

Horsepower is workpower! With Hystaway on the job, you enjoy *all* of these plus-power advantages:

- ✓ Steadier, Easier Digging
- ✓ Full Bucket in One Pass
- ✓ Fewer Hang-Ups
- ✓ Higher Daily Production
- ✓ Ample Lugging Power to prevent stalling in hard ground
- ✓ Less Operator Fatigue
- ✓ Lower Operating Costs
- ✓ Less Down Time
- ✓ Reduced Engine Strain and Wear
- ✓ Lower Maintenance Costs

MOUNTS ON NEW OR USED CATERPILLAR D8, D7, D6 TRACTORS. Combines tremendous tractor engine power with true track-type mobility and maneuverability. Quickly convertible for use as a Shovel, Backhoe, Dragline, Clamshell, Crane, Piledriver PLUS full production Tractor Bulldozer.

Sold and serviced at more than 700 Caterpillar-Hyster dealer stores throughout the world. See your dealer today.

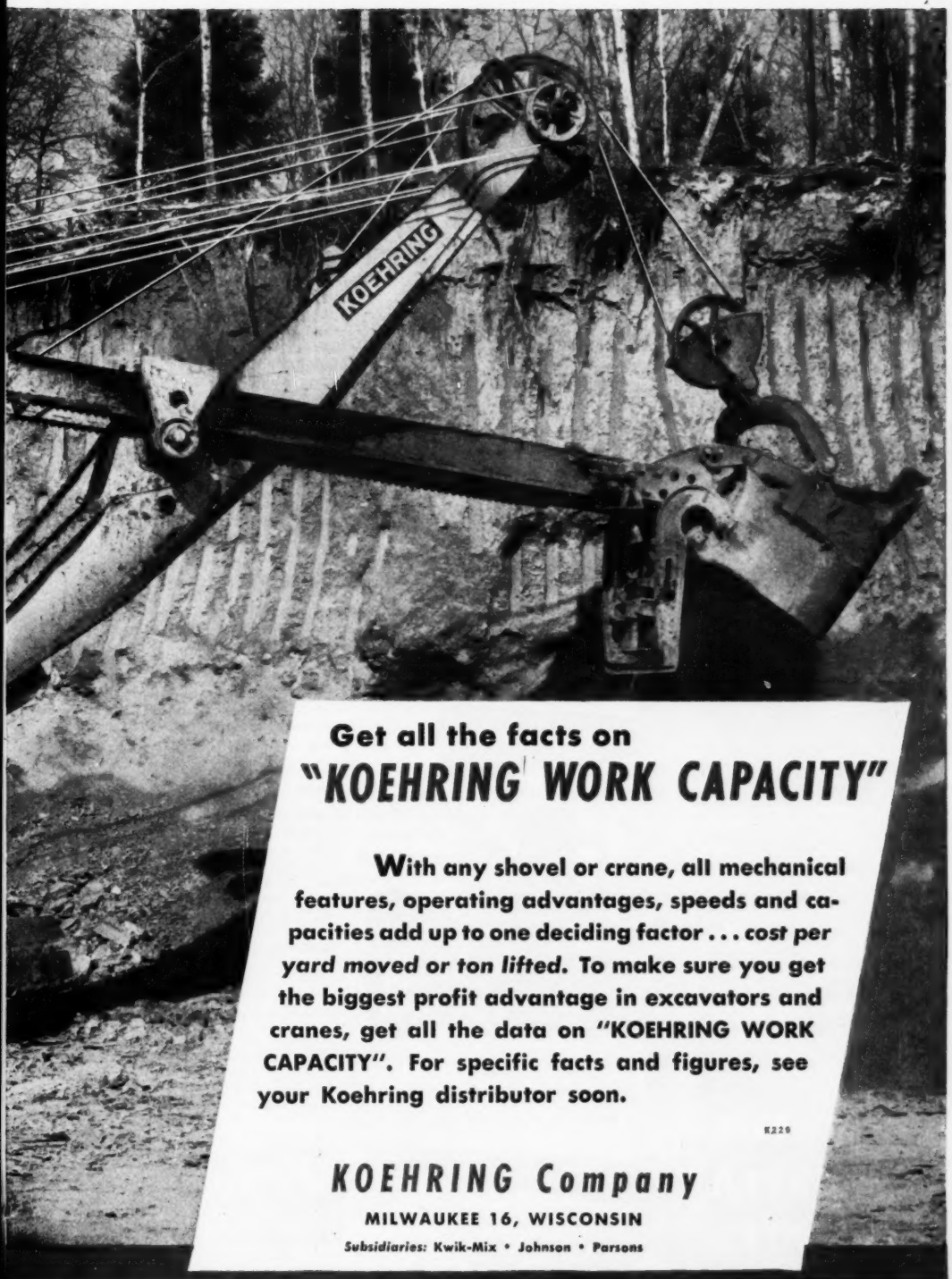
Write for NEW Literature

HYSTER COMPANY
2921 N. E. Clackamas, Portland 8, Oregon
Send me your new 20-page catalog containing specifications and complete information on the applications and uses of the Hystaway Excavator-Crane.

Name_____
Company_____
Address_____
City_____ State_____

HYSTER COMPANY
2921 N. E. CLACKAMAS ..... PORTLAND 8, OREGON
1821 NORTH ADAMS STREET ..... PEORIA 1, ILLINOIS

KOEHRING
HEAVY DUTY



Get all the facts on

"KOEHRING WORK CAPACITY"

With any shovel or crane, all mechanical features, operating advantages, speeds and capacities add up to one deciding factor . . . *cost per yard moved or ton lifted.* To make sure you get the biggest profit advantage in excavators and cranes, get all the data on "KOEHRING WORK CAPACITY". For specific facts and figures, see your Koehring distributor soon.

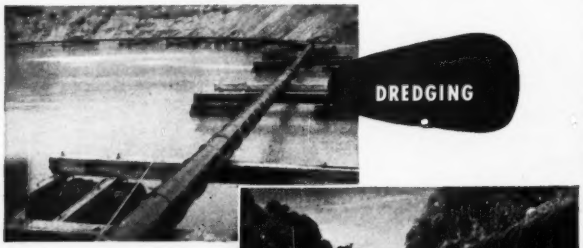
K229

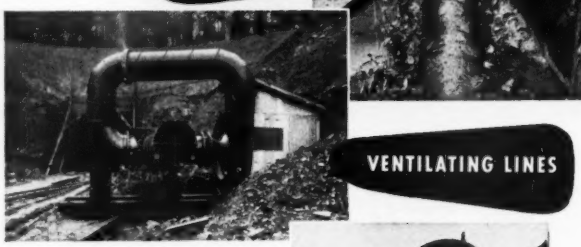
KOEHRING Company

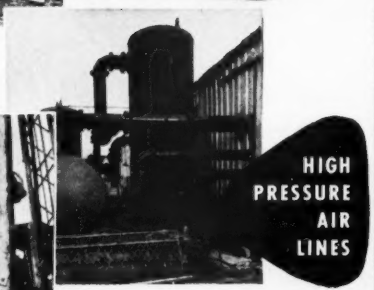
MILWAUKEE 16, WISCONSIN

Subsidiaries: **Kwik-Mix • Johnson • Parsons**

On any of these construction jobs NAYLOR Light-Weight Pipe gives you PERFORMANCE THAT SPEAKS FOR ITSELF







Write for Naylor Bulletins
No. 507, No. 513 and No. 514

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Naylor Pipe Company
1268 E. 92nd St., Chicago 19, Ill.
New York Office:
350 Madison Ave., New York 17, N.Y.

SALES AND SERVICE . . .

Continued from page 142

This should be of interest to the armed services and all Caterpillar distributors and customers on the Eastern seaboard and in Europe, because the warehouse is strategically located with relation to the East in general and particularly to the ports of Baltimore, Philadelphia and New York.

Association Activities

Portland Cement Assn.: Miles D. Catton, Director of Development since 1949, has been appointed assistant to the vice-president for Research and Development, succeeding H. F. Gonnerman who has retired. Douglas McHenry has taken over Mr. Catton's former position.

Cast Iron Soil Pipe Institute: Important savings in construction costs will result from new fitting weight specifications presented at the national meeting of the Institute, Oct. 17 and 18. It is said that they also will promote greater efficiency in handling cast iron pipe by plumbing wholesalers and contractors.

Structural Clay Products Institute: The Institute has announced that every state in the Union now has at least one labor-management group encouraging bricklayer apprenticeship. Nation-wide interest in creating more skilled brick and tile masons has encouraged the formation of Joint Bricklayer Apprentice Committees from coast to coast. An all-time-high figure of 462 such committees, composed of building and mason contractors and bricklayer union representatives, is currently operating.

American Institute of Steel Construction: John E. Jackson, president of Pittsburgh-Des Moines Steel Co., Pittsburgh, has been elected president of the Institute; Earle V. Grover, president, Apex Steel Corp., Ltd., Los Angeles, was elected first vice-president; N. P. Hayes, president of Carolina Steel & Iron Co., Greensboro, N. C., was elected second vice-president and James M. Straub, president, Fort Pitt Bridge Works, Pittsburgh, was re-elected treasurer.

Portland Cement Assn.: James A. Foster, senior engineer of the Highways and Municipal Bureau, has been appointed assistant manager of the Bureau. He succeds L. M. Arms.

THE JACKSON
ASPHALT-GRANULAR SOIL COMPACTOR

NOW VASTLY MORE POWERFUL, FASTER

Quickly INTERCHANGEABLE BASES OF 12" TO 24" WIDTHS

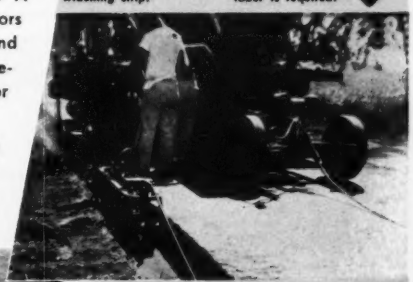
The new, heavy-duty, exceedingly powerful vibratory motor now incorporated in the JACKSON COMPACTOR has stepped up its walking speed and power greatly. It will compact granular soils at optimum moisture to specified density in depths of 8 to 12" at the rate of 2400 sq. ft. per hour.

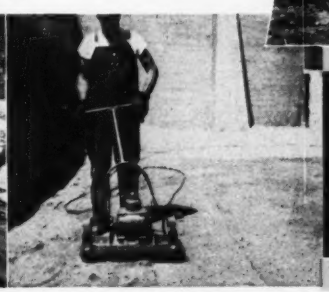
For compacting granular soil in sub-bases of concrete floors, in bridge approaches, close to abutments, and for compacting blacktop mixtures in pavement widening and patching, paving drives, walks, railway platforms and crossings, this machine with its quickly interchangeable bases, is the most convenient, mobile and efficient time and money saver on the market. A tandem version utilizing two heavy-duty compactor motors mounted on bases of proper width is amazingly efficient and economical for compacting granular fill in trenches, in pavement widening operations, to provide a stabilized base for the blacktop widening strip.

Operated by a Jackson Power Plant mounted on auto trailer with means of quickly picking up and lowering the compactor. See it at your Jackson Distributor, who has it both for sale and for rent, or write for complete details.

▲ Tandem Compactor stabilizing granular sub-base for blacktop pavement widening strip.

Tandem Compactor easily keeps up with spreader and is controlled by spreader operator. No additional labor is required. ▼





JACKSON VIBRATORS, Inc.
LUDINGTON
MICHIGAN

Big

ESTABLISHING MOUNTAIN-TOP BASE, a helicopter and a TD-24 put men, machinery and supplies on mile-high pass as first step in efforts to build road down to meet section coming up from each side. TD-24 pulled yarder, winch, and compressor into pass after bitter 7-day fight.

1 RAISING KENNEY DAM to fill the Grand Canyon of the Nechako River, workers sluice down some of the 3.8 million cubic yards of earth and rock it will eventually contain. Dam will form a reservoir with twice the capacity of Grand Coulee. TD-24 in foreground strips blasted rock from canyon wall abutment.

2 HEADING OPERATIONS at Kenney Dam are (left to right) Alcan Resident Engineer Harry Jomini; General Superintendent "Hak" Nielsen and Project Manager Jack Bremner, both of Mannix, Ltd., sub-contractor for Morrison-Knudsen Company of Canada, Ltd. 110 miles west, dammed-up waters will be diverted through mountains and dropped a half mile to run turbines in sea-level powerhouse.

3 DRIVING TEN-MILE TUNNEL through mountain is done from four headings. Here, half a mile above ocean-level valley, aerial tramway has delivered TD-24 to tunnel portal for working debris down mountain. 2,600 feet below, eight-story powerhouse inside mountain is being mucked out by a TD-24 and a TD-9.

Red TD 24 Pioneers New Frontier

59 International TD-24s spearhead largest integrated engineering program in history for Alcan (Aluminum Company of Canada, Ltd.) on Project British Columbia

A fleet of 59 hard-hitting International TD-24s is blazing a new frontier across 5,000 square miles of wilderness in British Columbia.

Twenty-four hours a day, they're on the go for Morrison-Knudsen Company of Canada, Ltd., prime contractor for most of the giant development that includes:

Building the largest sloping clay core dam in the world

Driving a subway-size tunnel ten miles through a mountain

Blasting out an eight-story powerhouse two blocks long inside solid rock

Erecting a transmission line fifty miles long over a jagged mountain range

Raising the world's largest aluminum smelter and a new port city at Kitimat where 50,000 people may eventually live and work.

A. O. Strandberg, project manager for Morrison-Knudsen, says:

"These TD-24s are doing the impossible. We never thought any tractor could go where these tractors are working now. They have the weight, they have the balance, and they have the power to get the job done."

And here's what superintendents on the firing line say:

Bill Richards: *"They're pushing boulders uphill we had to dynamite in the old days."*

Herb Wilkinson: *"I wouldn't believe where they'd go until I got them on my crew."*

John Hutton: *"They're doin' work up here they were never built for but they're doin' it just the same."*

Your International Industrial Distributor can give you the facts and figures on the TD-24. See him. You'll be a TD-24 man from then on in!

INTERNATIONAL HARVESTER COMPANY • CHICAGO 1, ILL.

INTERNATIONAL HARVESTER

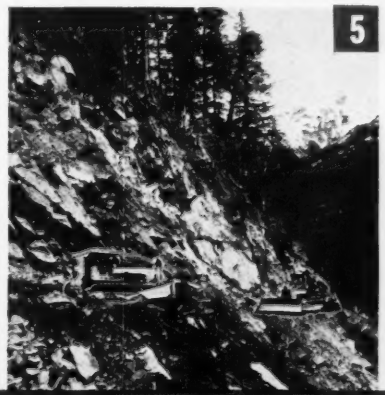
INTERNATIONAL

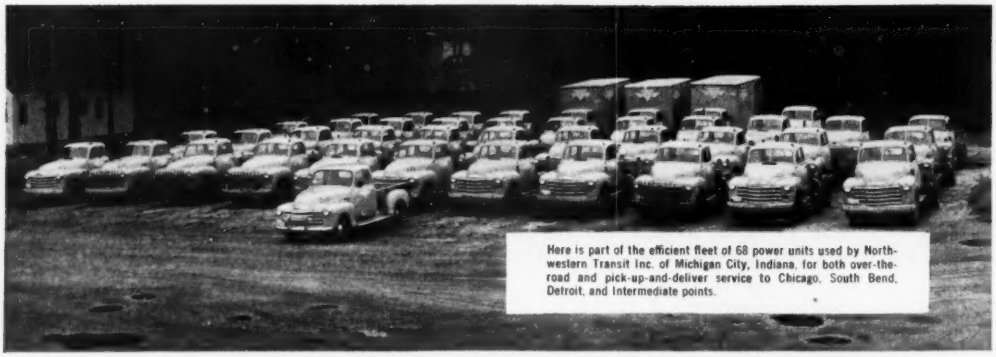
POWER THAT PAYS

4 **INSPECTING MOUNTAIN TOP OPERATIONS** at Kemano, headquarters for construction of powerhouse, tunnels and transmission line are (left to right) A. O. Strandberg, Project Manager for Morrison-Knudsen; F. T. Matthias, Alcan Assistant Project Manager, and Walter Abrahamson, Alcan Assistant Resident Engineer at Kemano.

5 **LINKING UP POWER TRANSMISSION LINE ROAD,** a pair of TD-24s doze toward each other through blasted rock. Across 50 miles of rugged terrain like this, a mountain-anchored powerline will be built to flash abundant electricity from mountain powerhouse to smelter at tidewater.

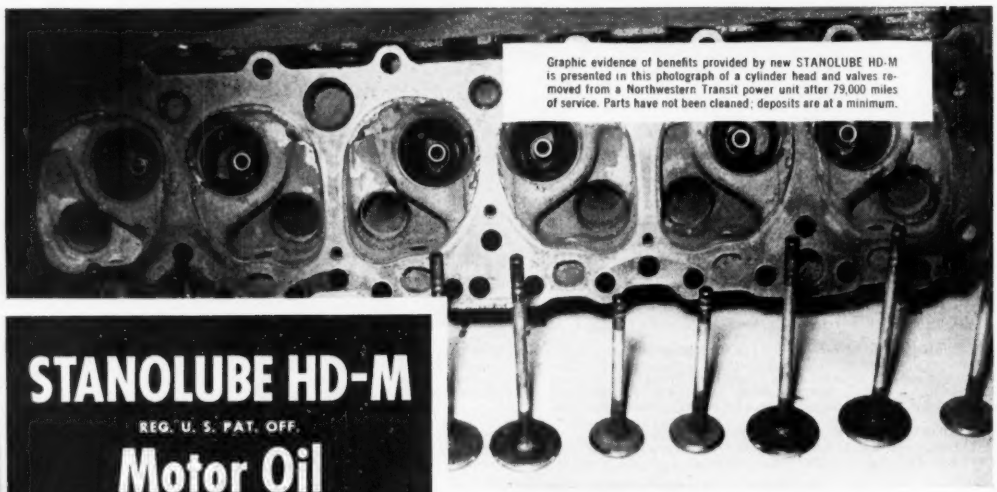
6 **NEW LAND IS MADE IN OCEAN INLET** by dredge which deepens anchorage for ocean shipping at the same time. H. M. Whiting (right), Project Manager for Kitimat Constructors, Ltd., and a superintendent study progress. Part of this 70 acres of new land will become site of new aluminum smelter. Town which may eventually become city of 50,000 will be built across the bay.





Here is part of the efficient fleet of 68 power units used by Northwestern Transit Inc. of Michigan City, Indiana, for both over-the-road and pick-up-and-deliver service to Chicago, South Bend, Detroit, and intermediate points.

Now, over 80,000 miles between overhauls



Graphic evidence of benefits provided by new STANOLUBE HD-M is presented in this photograph of a cylinder head and valves removed from a Northwestern Transit power unit after 79,000 miles of service. Parts have not been cleaned; deposits are at a minimum.

STANOLUBE HD-M

REG. U. S. PAT. OFF.

Motor Oil

● An aggressive policy of stopping trouble before it develops into a serious problem has well rewarded Northwestern Transit Inc., of Michigan City, Indiana.

Six years ago, officials of this fleet discussed lubrication troubles with a Standard Automotive Engineer. As a result, they switched their entire fleet to STANOLUBE HD, Standard's original heavy-duty motor oil. Bearing troubles and ring sticking previously experienced with a conventional lubricant were eliminated. Valve life was extended.

When Standard's new and better STANOLUBE HD-M Motor Oil was introduced recently, Northwestern Transit readily adopted it for use. In the face of increasingly severe service, STANOLUBE HD-M through its better detergent-dispersant action has provided greater engine cleanliness and has further extended valve life. The 68 units in this fleet now average from 80,000 to 100,000 miles between valve jobs. Operating costs, not including depreciation or tires, have been reduced to the impressive low average of six cents per mile.

The experience of Northwestern Transit indicates the benefits you can obtain by using new and better STANOLUBE HD-M Motor Oil. A Standard Oil Automotive Engineer will be glad to help you. Phone your local Standard Oil (Indiana) office. Or write: Standard Oil Company, 910 South Michigan Ave., Chicago 80, Ill.

STANDARD OIL COMPANY STANDARD *(Indiana)*

Build Good Logging Roads

GOOD HAUL ROADS are one of the marks of good forest management. When constructed properly, these roads reduce the costs of logging operations and transportation to the mill. In addition, they will be designed to give access to timber stands for protection against fire and will serve as fire breaks.

As in the construction of any road, logging roads are built and maintained most economically by specialized machines to handle particular phases of the job.

The Caterpillar Tractor Co., after making a study of earthmoving and roadbuilding for loggers, divides the work into three basic zones—each calling for a different type of equipment. They are: Zone 1, power equipment; Zone 2, slow-speed hauling equipment; Zone 3, high-speed hauling equipment.

Power equipment such as crawler tractors with bulldozers, rippers and other pioneering tools handle Zone 1 work. This equipment works in areas where heavy power at low speed is required. Conditions associated with steep grades, poor ground support and restricted areas dictate Zone 1 operations. The most common tool is a crawler tractor with bulldozer. Its economic earthmoving limit is considered normally to be a one-way push of 300 ft.

For High Production

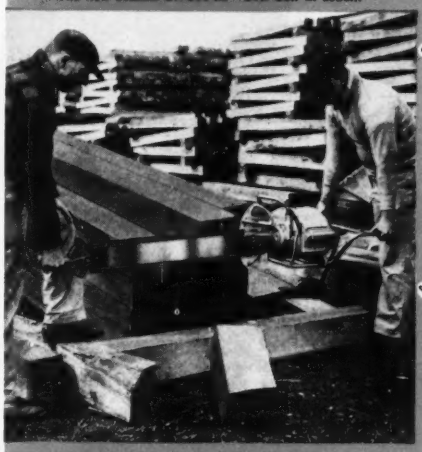
Scrapers and wagons pulled by track-type tractors are recommended for Zone 2 work, where high production may be a factor. Usually lengths of haul are too great for straight dozing, but too short to let rubber-mounted earthmovers develop a high cycle speed. Again ground conditions may not permit rapid travel, work may be of a pioneering nature, grades may be excessive, or other conditions may prevent maintenance of good haul roads.

Zone 3 thrives on speed; areas and conditions where rubber-tired tractors with scrapers and wagons can be used. This zone exists where haul distances are long enough to develop high average haul and return speeds and where grades are moderate.

Once built, logging roads can be maintained at reasonable cost with a motor grader.

DISSTON does it faster... BETTER

The new Disston DA-211 25" Bow Saw in action.



The DA-211 slices through 16x16 timbers in no time at all.

THERE IS A DISSTON CHAIN SAW WITH MERCURY GASOLINE ENGINE FOR EVERY WOODCUTTING JOB

DO-101 with helper handle

One-Man DO-101

DO-101 16" Bow Saw

DA-211 with helper handle

DA-211 25" Bow Saw

No matter which Disston Chain Saw you choose, you're sure of getting a first quality professional tool . . . one that has saved time and labor for utilities, shipyards, railroads, constructors and industrial plants the country over.

The Disston DA-211 is powered by a reliable air-cooled 2 cylinder, 2 cycle Mercury Gasoline Engine. The Mercury develops 9 hp at 5500 rpm, gives the Disston an extremely favorable power-weight ratio. Automatic clutch. Self-rewinding starter. Automatic chain lubrication. Full-swivel transmission. The narrow-profile guide rails (from 2′ to 7′) reduce binding; the fast-cutting chains slice through 18″ oak in less than 16 seconds. The DA-211 and its lightweight counterpart, the smaller DO-101, make perfect working partners. The DO-101 is ideal for one-man operation, and can be converted quickly into a lightweight two-man unit with rail lengths up to 40″.

You will find a complete line of Disston power saws at dealers the country over. Any of these men will be glad to demonstrate how a Disston does it faster . . . better. For the name of the one nearest you, write HENRY DISSTON & SONS, INC., 2-K Tacony, Philadelphia 35, Pa.

FREE! Send for your free copy of the new fact-packed and picture-packed booklet "How to Cut Costs and Make Money with Disston Chain Saws."

teamwork in specialties

THE BLASTER

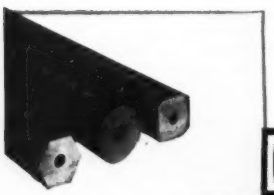
CRUCIBLE HOLLOW DRILL RODS

In rock-drilling operations, the blaster is a key man. He plans the blast, tells the drill-runners where to drill their holes, loads the charge for the greatest effectiveness.

He expects . . . and gets . . . peak efficiency from his men and the tools they use.

This is why Crucible Hollow Drill Rods rank first with crews supervised by top-notch blasters. Experience has shown them that Crucible rods stand the rapid-fire battering of modern rock-drilling longer; give them the least breakage, the greatest service life.

Crucible Hollow Drill Rods are right for the job because they are made by the world's largest producer of *tool and high speed steels.* From this metallurgical experience come the high mechanical properties that have set record after record for least cost per foot drilled. Use Crucible Hollow Drill Rods in all your drilling operations.



CRUCIBLE first name in special purpose steels

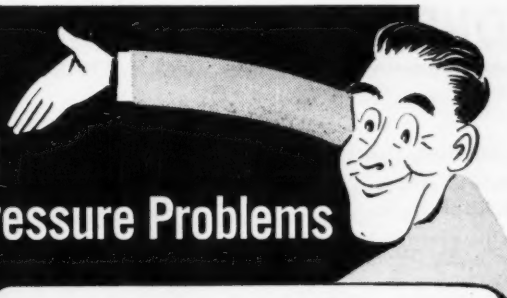
52 years of *Fine* steelmaking

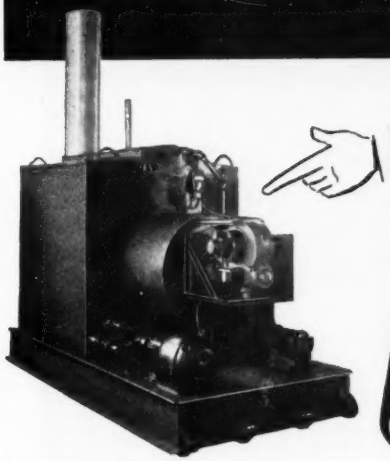
HOLLOW DRILL RODS

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

REX HIGH SPEED • TOOL • REZISTAL STAINLESS • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS

HO Hot Oil Heaters for LO Pressure Heating NO Freeze, Rust or Pressure Problems





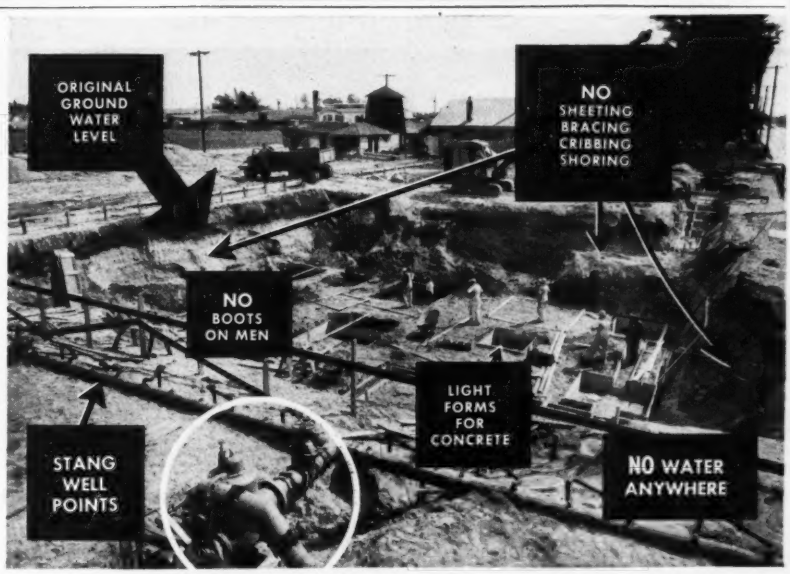
Here's the most efficient hot oil heating system available today! Hopkins developed this low-pressure heater for asphalts, chemicals, heavy oils, plastics, waxes, and many other materials. It's completely automatic, easy to operate, and gives you accurate, uniform heat control 24 hours a day. Ends all freeze, rust and pressure problems—lessens maintenance worries.

If your industrial heating process requires a temperature between 212° F. and 400° F., the HO System is your best bet for dependable, low-cost heating. Write or phone us today for literature and complete details.

HOPKINS VOLCANIC SPECIALTIES, INC.
ALLIANCE, OHIO

WHAT STANG MEANS BY "SHORING IN THE DRY"

THE picture tells the story . . . a story of the results of using Stang-Wellpoints to predrain the foundation of the Associated Telephone Building in Oxnard, California—for the Associated Telephone Company of Santa Monica, California. There couldn't be a better "show-me" illustration of how Stang Wellpoints really dry up any kind of a wet job. You won't see any water anywhere in this photo—no water was visible anywhere at any time after the excavation began, except at the end of the Stang pump discharge line. And the Contractor, Beyer & Abrahamson of Los Angeles, will confirm our statement.



JOHN W. STANG CORPORATION

Engineers and Manufacturers of Dewatering Equipment

BELL, CALIFORNIA
8221 Atlantic Avenue
Box 631 Telephone: Logan 5-7421

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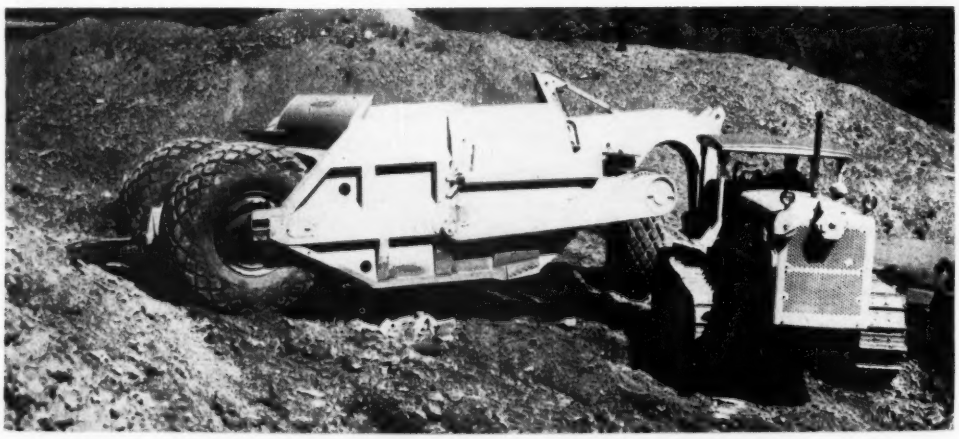
CONSTRUCTION EQUIPMENT NEWS . . A Preview of

JAMES M. CONNOLLY, Equipment Editor

Accordion-Type Sleeves Protect Rams on Rock Drills

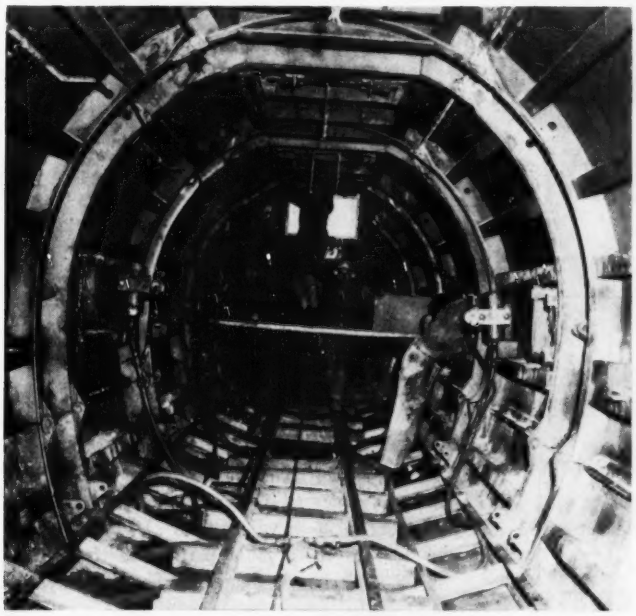
Gortite sleeve and boots are common sights hydraulic connecting rods, rams, guide rods and the like. They expand in accordion fashion along with the ram and protect plunger cylinders from dust and dirt. The latest use for them in the construction industry is to protect lifting and swinging rams on Joy rock drills, such as the one above, which are remote controlled. In this instance the neoprene-nylon sleeves are 28 in. long before stretching and have an outside diameter of 4½ in. For other needs they can be fabricated to order, without mold charge, up to 30 ft in length and with 24-in. o.d. During recent Navy tests the flexible material showed no signs of cracking at temperatures from 220 to minus 45 deg F.—**A & A Mfg. Co., 2017 W. Claybourne St., Milwaukee, Wis.**



"Cat" No. 90 Scraper, with D8 Tractor, Can Carry 31 Cu Yd Heaped

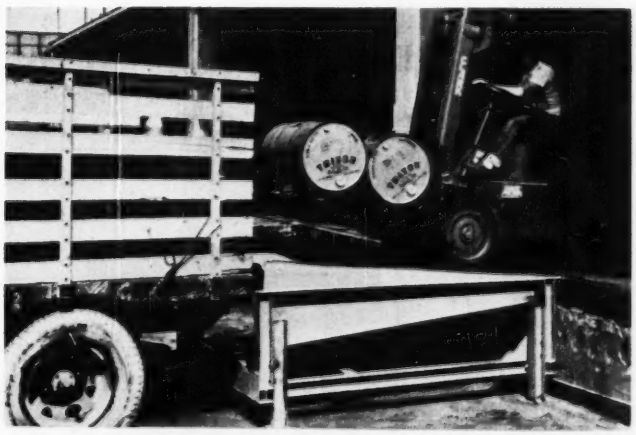
Taking a tight turn at the far end of a run and straightening out for a new load is the combination of Caterpillar's No. 90 scraper and a D8 tractor. By adding top extensions or sideboards a contractor can increase struck capacity from 21.2 to 25.5 cu yd; the heaped capacity from 27 to 31 cu yd. The scrapers are manufactured and shipped from "Cat's" new plant in Joliet, Ill., and weigh 35,100 lb. Front tires are 24.00-29; rear, 27.00-33, all 24 ply. When loaded, 60% of the gross weight sits on rear tires. Cutting edge is reversible and hard-surfaced and bowl is of flat, double-bottom type, made from high-tensile steel. Loading and ejection are cable-controlled from rear of the tractor. The equipment in the picture is owned by M. Livingood, Inc., of Walnutport, Pa., and is turning for another cut on relocation of a state highway near Shamokin, Pa.—**Caterpillar Tractor Co., Peoria 8, Ill.**

New Machinery, Tools and Equipment That Will Help You on the Job



Vibrators Assure Dense Concrete in Tunnel Lining Pour

The tunnel shown here is a 6-mi bore of horseshoe shape with finished diameter of 9 ft 3 in. Concrete lining of 11-in. average was poured continuously, on advancing slope method with pneumatic power. Viber electric internal vibrators were used to vibrate concrete from invert to springline level of the arch, fed into the pour through inspection doors. Later new type external vibrators were fastened to the form ribs above spring line and leapfrogged ahead on 8-ft centers, one on each of the arch form. A new air clamp fastens the internal vibrator firmly enough to transmit vibrations through 20 to 25 ft. They operate for 40 sec every 2 min. On this job the tunnel foreman fastened one to an elbow on the discharge line to prevent any plugging of the tube. — **Viber Co., 726 S. Flower St., Burbank, Calif.**



Portable Loading Ramp Unit Adjusts to Truck Heights

Differences in height between truck beds and a loading platform can be compensated with a portable loading ramp. It's adjustable manually or electrically through 24 in. to match truck height. Called the John B. Illo loading ramp, it can be installed in 5 min, and adjustments take only a few seconds for each truck. It will handle the combined weight of a fork-lift truck and its load up to 10 tons on a high-traction diamond-shape plate deck. Power is ½-hp motor direct-connected to a ⅜-in. standard Viking 350-psi hydraulic pump. — **John B. Illo Co., 2414 E. 57th St., Los Angeles 58, Calif.**

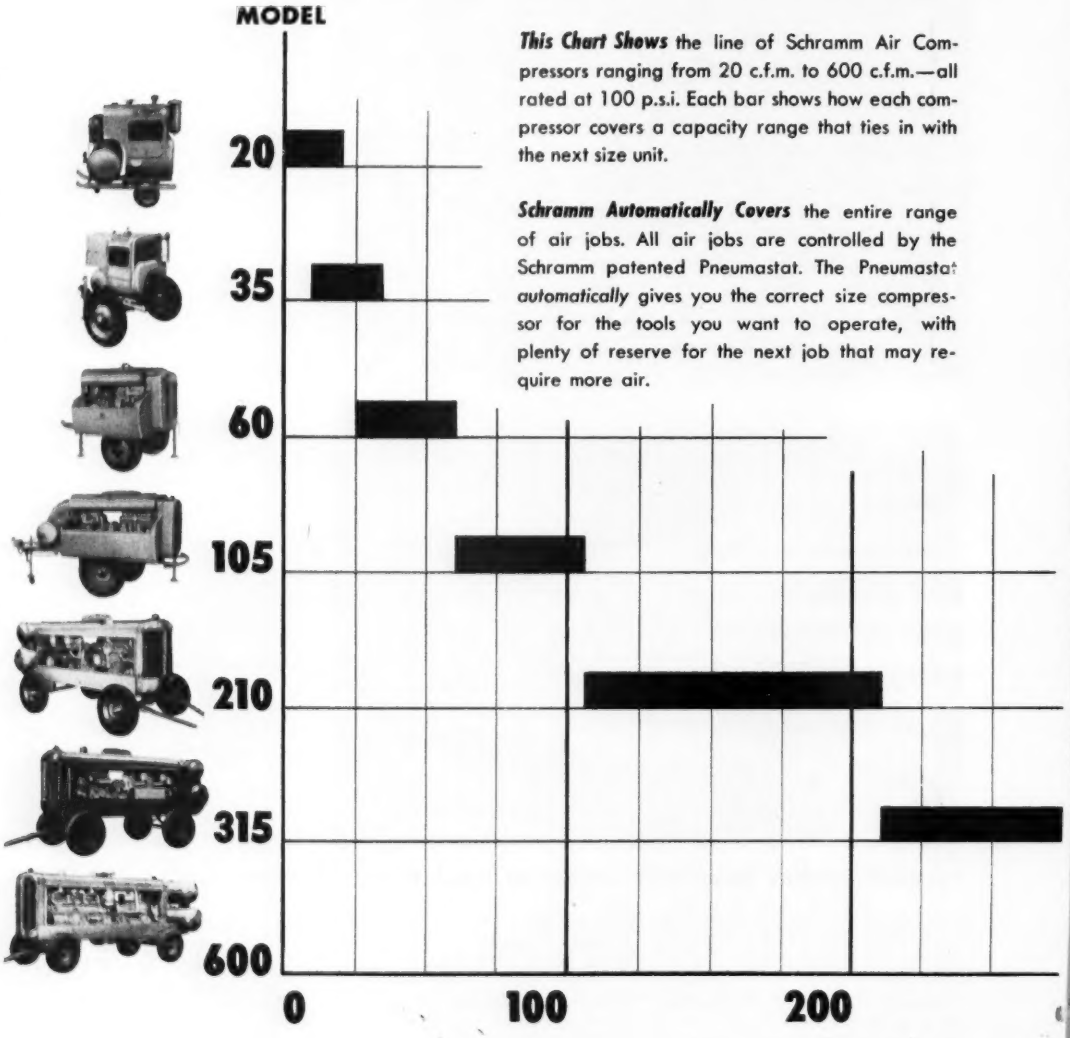
Sharpens Circular Saws

The "Sharp-Smith" is a new machine for sharpening and setting circular saws, as well as for sharpening planer and jointer knives, hand plane irons, wood chisels and other cutting edges. It's said to be able to joint, gum, bevel grind and set all makes of circular saws

(Continued on page 158)

SCHRAMM

the most complete line of portable air air jobs . . . greater range of



This Chart Shows the line of Schramm Air Compressors ranging from 20 c.f.m. to 600 c.f.m.—all rated at 100 p.s.i. Each bar shows how each compressor covers a capacity range that ties in with the next size unit.

Schramm Automatically Covers the entire range of air jobs. All air jobs are controlled by the Schramm patented Pneumastat. The Pneumastat *automatically* gives you the correct size compressor for the tools you want to operate, with plenty of reserve for the next job that may require more air.

OFFERS YOU...

compressors that automatically cover all capacities with fewer sizes!

For example, the Schramm Unistage Model 210 can do a job requiring only 160 c.f.m. at an operating cost no greater than a machine built and designed for a maximum capacity of 160 c.f.m. But if you need 185 c.f.m. on that job or a future job, your Schramm Unistage 210 model will *automatically* deliver the required amount of air up to its full rated capacity.

New Uses. There is a Schramm air compressor of the size capacity to take care of every air job including the hundreds of new uses for air developed in recent years.

How To Pick The Right Compressor. Send for your free chart showing the number of tools that can be operated on various size compressors. We think you will find it highly helpful.

SCHRAMM, INC.

The Compressor People

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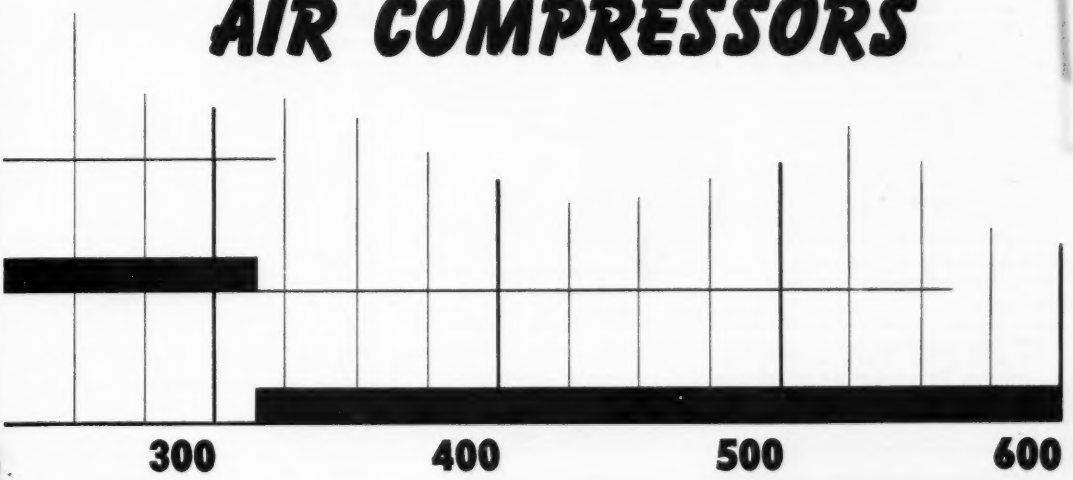
SCHRAMM AIR COMPRESSORS

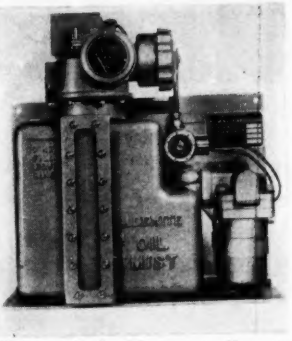


C.F.M. @ 100 P.S.I.

from 4- to 48-in. dia. With planer and jointer knives the operator needs only to set height and bevel once; then the entire set of knives can be sharpened without resets. There's one positive setting for jointing circular saw teeth and another for uniform depth of gullet, assuring perfect balance without wobble or vibration.—**Belsaw Machinery Co., Dept. S-381, 315 Westport Rd., Kansas City, Mo.**

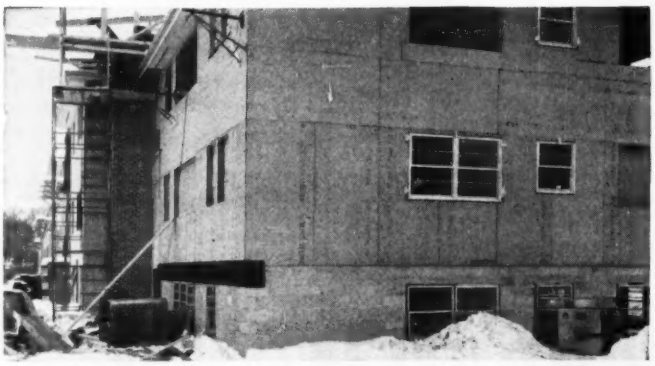
AUTOMATIC WARNING SWITCHES—Alemite has developed a new oil-mist lubricator with a 1-gal oil reservoir and built-in automatic warning switch, which can signal the operator by horn and red light, or shut off a machine, if the oil level becomes too low. Wherever needed, units with 12-oz reservoirs are also now available with these same built-in warning switches.

Previous models, through employment of a solenoid switch, gave lubrication when the machine on which they were used was in operation, but had provision only for visual check of oil in the reservoir. The new gallon-size reservoir cuts frequency of filling and the signaling device makes it impossible for the unit to run dry accidentally. Two models are available: One, Model



4958, is wired with a normally open switch to make contact when oil level goes below 23 oz. Model 4859 has a closed switch which breaks contact when the oil level goes below 23 oz and also shuts off its machine. The same control results with Model 4960 and Model 4961, respectively, on 12-oz reservoir systems—actuating an alarm or shutting off the machine at the 2-oz mark.—**Alemite Division, Stewart-Warner Corp., 1826 Diversey Parkway, Chicago 14, Ill.**

Keep your jobs moving this winter . . . *regardless of weather*

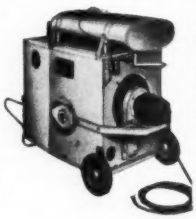


HERMAN NELSON PORTABLE HEATERS

There's no reason why your winter schedules should be upset by bad weather this year. You can keep your jobs moving and your workers more comfortable if you put Herman Nelson Portable Heaters to work for you. These furnaces on wheels provide clean, pure, hot air to warm your workers, protect concrete pours, thaw machinery, dry plaster—do scores of other heating and drying jobs.

The only completely safe portable heater that uses flexible ducts to spot heat where most needed—and remember, only uncontaminated air heaters are absolutely safe!

Contractors all over the country are buying Herman Nelson Portable Heaters. Many users find that these units pay for themselves during the first winter. Investigate how you can beat winter weather on your job. Mail the coupon below for full information.



HERMAN NELSON ECONOMY MODEL
Priced lower for the smaller jobs. Capacity 125,000-190,000 BTU/hr. Oil fired, electric powered. Costs only 19¢ per hour to operate. Other models available—electric or gasoline powered with capacities to 450,000 BTU/hr.

Herman Nelson Division, Dept. 13
American Air Filter Company, Inc., Moline, Illinois
Gentlemen: Please send me complete information about Herman Nelson Portable Heaters and a free copy of your Cost Control Booklet.

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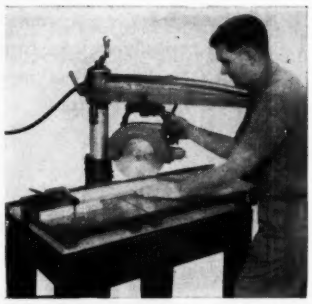
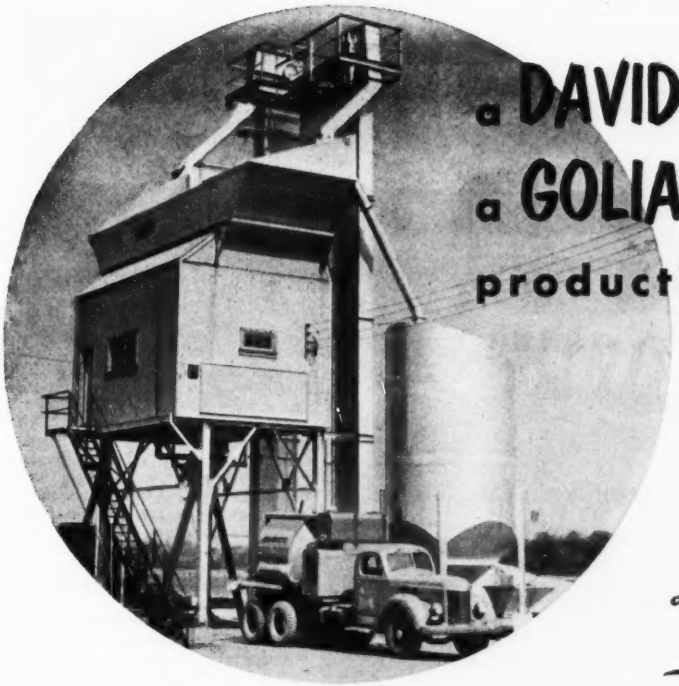
City_____ State_____



RADIAL TYPE SAW—Instead of cutting wood with a standard blade on a hardwood top, the operator here is fabricating light metal parts with a metal-cutting blade on a special metal top, illustrating the quick conversion possible with the new DeWalt GW, a 1-hp radial arm machine. Increased specialization in fabricating light metals called for a machine more versatile than the straight cut-off type. The radial type DeWalt GW not only makes straight cut-off, but also miter, bevel, and compound-miter cuts in a matter of seconds. Because it is a radial type machine, there is no lengthy delay when changing from one cut to another. Metal-cutting saw blades can be used on aluminum and other nonferrous stock, or with abrasive wheels on small-size steel and other ferrous metals. Then, by removing the extra metal cutter top and replacing with a wood-cutting blade, the machine can be converted for woodworking operations.—**De Walt Inc., Lancaster, Pa.**



a DAVID in size... a GOLIATH in production...

Remarkable portability **is the keynote of this BUTLER Ready Mixed Concrete Plant. The 85 yard 4 compartment bin ships in one piece. Legs and bracing, when knocked down, complete a load for one flat car or low-bed trailer. A second load is made up of elevator, batchers and one-piece overflow cement bin. Erection is quick and easy with a crane and 3 men.**

A number of portable BUTLER Ready Mixed Plants as well as many installations of BUTLER *engineered design* are shown in Butler Bulletin 185. Write for your copy today.

Portability **makes location at your job site practical; eliminates a large investment in costly truck-mixers. And with well co-ordinated delivery of materials either to crane, belt conveyor or elevator — production will be equal to the usual Goliath-like plant.**

As a permanent installation **in small communities — or as multiple unit installations strategically located in and around metropolitan areas, the plant's versatility in production and the low investment required means lower cost per cubic yard and a correspondingly greater profit.**

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Johns-Manville Industrial Friction Materials are specified by most leading manufacturers of earth moving equipment

When it's time to replace clutch and brake friction materials on your own machines, here is something worth considering.

Manufacturers with a vital interest in the performance of their equipment prefer J-M Industrial Friction Materials! Time and again they have set records for endurance and low-cost operation. Whether in block, lining, facing or cone form, J-M Friction products are engineered for the job—formulated for maximum service life and top performance. Rigid manufacturing and inspection controls insure uniform high quality and reliability.

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INDUSTRIAL FRICTION MATERIALS
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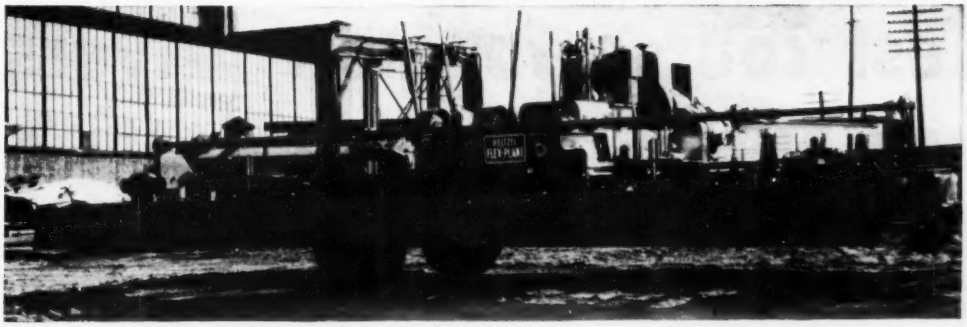
SAFETY CAN FOR FLAMMABLE LIQUIDS—A newly designed safety can, listed and labeled by Underwriters Laboratories Inc, meets the requirements of all states and municipalities having safety laws for the handling, transportation and storing of gasoline and other flammable liquids. It also fills the need for an UL-approved safety can for all industries where this precaution is essential to protection of plant or personnel and demanded by fire insurance companies.

A cam-acting connecting arm is of special tapered design; if the can is upset or struck, this arm link tightens the pouring spout seal. The handle is free-swinging for carrying. To pour, you simply engage the handle notch and press the handle down to open the cap. Cans are available in 1-, 2½- and 5-gal capacities. Body is one-piece Terne coated steel, and body and breast are electrically welded together under electronic control.—**Eagle Manufacturing Co., Wellsburg, Va.**

LIFTING MAGNET GENERATING PLANT — Two electric generating plants, built specifically for commercial and industrial lifting magnet use, are announced. These 3,000- and 5,000-w dc plants are designed for both stationary and portable service in either manual or remote electric starting models. Prime power for the plants is provided by an Onan CK two-cylinder, air-cooled, 4-cycle engine. Extra large bearings have been built into the engine along with pressure lubrication, and high tension magneto ignition. The magnet-service generators, direct-connected to the engine, have 230- to 250-v output with rheostat control, commutating poles, junction box and high potential tested insulation. They are of drip-proof design and cooled by a centrifugal blower. Approximate weights: For manual stationary models—325 lb; remote stationary models—345 lb; manual portable models—305 lb. Ask for Magnet Service Form A-290. For complete specifications write **D. W. Onan & Sons, Inc., Minneapolis 14, Minn.**

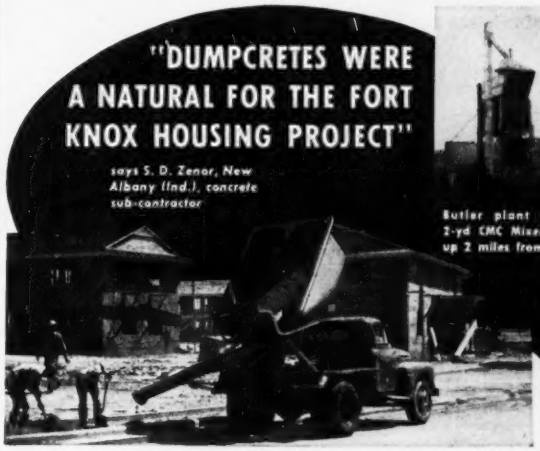


PORTABLE FINISHING MACHINE —Usually when you see a finishing machine moving, it's riding rails or forms and pushing concrete or hot mix ahead of its screeds. The new Detroit Finishing machine (above) moves another way as well. In a matter of seconds two pneumatic tires can be brought down from their nest in the machine frame and used to allow the rig to be towed behind a batch truck or any other vehicle. A hydraulic tongue lifter quickly spots the tongue on to a tow hook. Many advances are incorporated into the new rig. Because city street paving calls for a variety of widths, the new Detroit Special was designed to be completely telescopic. Three basic machine sizes can finish widths from 10 to 27 ft. Both screeds are mounted outside the frame so that the machine can be set lower on the forms, providing greater rigidity and accessibility. An offset screed attachment is provided for integral curb work, the attachment rough-forming curbing automatically. The screeds themselves have been improved to give an infinite range of adjustment which permits not only quick crown change, but also synchronization of the front and rear screeds.—**Flexible Road Joint Machine Co., Warren, Ohio.**

MASONRY SAW CONVERSION KIT — Contractors and industrial maintenance departments can now modernize their dry-cutting masonry saws by installing a handy TARGET conversion kit. Wet cutting offers many advantages over dry: the recirculating and spraying of water on the cutting blade completely eliminates dust—longer blade life is experienced—and chipping along the edge of cut is eliminated. With this new adapter, the company claims that diamond blades which require water may be used to cut glass, marble, porcelain, glazed tile, acid brick and other similarly dense hard materials. Installable in 5 min, the kit consists of a steel reservoir for water, electric circulating pump, machine tubing and spray nozzles with inset holders and a canvas back drop. —**Robert G. Evans Co., 6315 Brookside Plaza, Kansas City, Mo.**

"DUMPCRETES WERE A NATURAL FOR THE FORT KNOX HOUSING PROJECT"

says S. D. Zenor, New Albany (Ind.), concrete sub-contractor



Butler plant with 2-yd CMC Mixer set up 2 miles from job

"32,000 yards is a lot of concrete," says Mr. Zenor, "especially when you make your pours in close quarters."

"We liked our four Dumpcretes for these tight spots, because they are light and easy-to-maneuver. With the high discharge and long chute we placed concrete direct . . . for foundations, porches, steps, sidewalks and parking areas. They were fast, too, and maintenance was nil."

Algernon Blair and Fort Knox Construction were contractors on the 1500-unit projects.

Dumpcretes charge fast, travel fast and place fast. Get the facts today.

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Fastest from plant to pour

Please send the following

☐ "Dumpcrete High-production Method"

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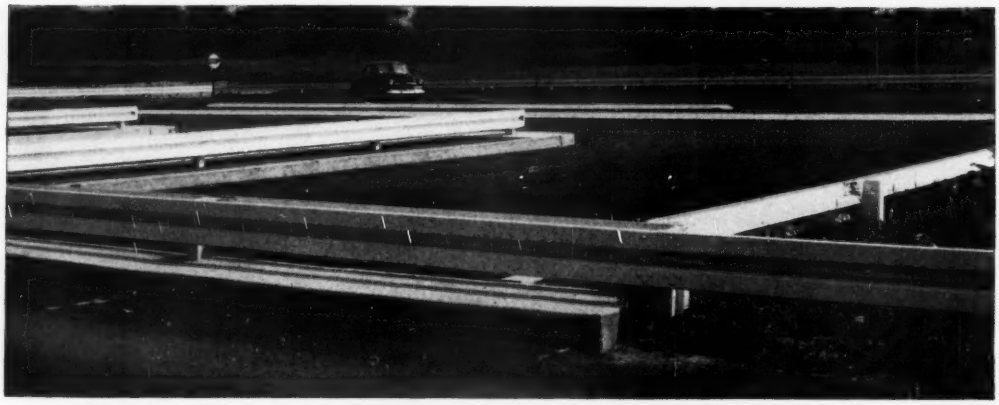
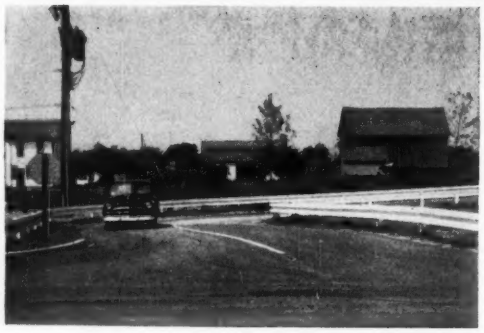
Test course for new drivers has Safety-Beam protection





WHAT CANDIDATE FACES—New driving course can be completed in 4½ wheel-twisting minutes. With a state trooper at his side, the driver must negotiate an upgrade figure 8 (above) in either second or high gear, make a complete turn in one of the narrow "stalls" (above) without touching the curb or the guard rail, stop and hold the car at an upgrade stop sign (lower left), and make sharp turns (left) unexpectedly banked the wrong way. It's a workout for the troopers, too; up to 400 tests some days.

Bethlehem Safety-Beam Guard Rail—1375 feet of sturdy steel—guides rookie drivers through a new test course at the Pennsylvania State Police barracks near Bethlehem.

The same features that led to the choice of Safety-Beam here have caused highway engineers to specify it for danger spots along many miles of highway. Safety-Beam sections lock together in a continuous beam. Impact is absorbed, not by a single post, but by a number of adjacent posts. One bolt fastens Safety-Beam to any type of post, and unskilled workmen can do the job without special tools.

For complete information about Bethlehem Safety-Beam Guard Rail—and other road steel products listed below—call the nearest Bethlehem sales office, or write to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Guard Rail
Guard Rail Posts • Wire Rope and Strand • Pipe
Hollow Drill Steel • Spikes • Bolts and Nuts
Timber Bridge Hardware • Tie-Rods
Sheet- and H-Piling • Fabricated Structural Steel

BETHLEHEM STEEL

FRONT-END TRACTOR LOADER—A new hydraulically operated, front-end loader is applicable to Ford and Ferguson wheel-type tractors. The standard material bucket has a capacity of 1/3 cu yd or 1,000-lb lift. Called Model WM-4, it is similar to the present WM-3 Wagner loader, but has a closer coupled bucket, longer dump reach, selective lift and height control and heavily reinforced dipperstick. The pump of the independent hydraulic system is tractor-mounted for correct alignment, driven through a coupling drive. Eighteen different attachments are available for all types of jobs.—**Wagner Iron Works, 1905 S. First St., Milwaukee 1, Wis.**

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wire rope jobs . . .

experienced riggers demand

GENUINE

CROSBY CLIPS

Drop-forged, hot-dip galvanized wire rope fasteners

SIZES FOR ALL WIRE ROPE

DISTRIBUTORS EVERYWHERE

AMERICAN HOIST & DERRICK CO.
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STANDARD
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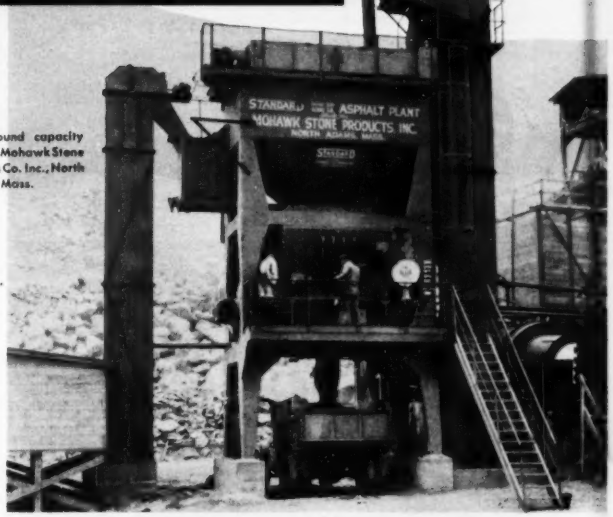

4000 pound capacity plant of Mohawk Stone Products Co. Inc., North Adams, Mass.

Keynote of the ever increasing popularity of the *Standard R. B. Asphalt Plant* is BALANCED PERFORMANCE. You can depend on the *Standard R B.* to deliver greater output with ease—because there are no bottlenecks. Features like extra large dryer capacity and oversized elevators, extra large vibrating screens and air handling systems assure this fact. As one operator puts it, "*You get amazing high capacity and just breeze along with a Standard Plant, whereas you would have to push everything at top pressure and not reach the same capacity with a competitive plant.*" Yes, the *Standard R. B.* outperforms them all. *Watch it in action and you'll join the hundreds of operators all over the continent who are "*Switching to Standard*". **Unit built—8 sizes, 500 to 6000 pound batch capacities. Send for full descriptive literature today.**

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STANDARD 50 YEARS STEEL CORPORATION

STANDARD STEEL CORPORATION

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Make Costly Manhours More Productive with Mall *Portable* Power Tools

Less sweat, less muscle, less end-of-the-shift fatigue but more work done — all this adds up to keeping the job on schedule and netting a better return on your contract when Mall Power Tools take over the hard work. Men like the "feel" of these husky, dependable tools and the contractor likes the low-cost maintenance and high scoring heavy-duty service — backed by over 30 years' experience in tool design, production and field testing.

MALL VIBRATORS — Mall concrete vibrators produce better finished concrete at minimum cost. Pneumatic, electric or gasoline engine models. Write for Bulletin 2022.

MALL CHAIN SAWS — Dependable cutting power for hard, soft, wet, dry or frozen wood. Pneumatic, electric or gasoline engine types. 12" to 144" capacity. Write for Bulletin 2066.

MALL DRILLS — Mall Drills have perfect balance, are built for years of service. Pneumatic or electric power. Capacities ¼" to 1¼". Write for Bulletin 2073.

40 Factory-Owned Service Warehouses, Coast to Coast, To Serve Our Customers and Thousands of Dealers

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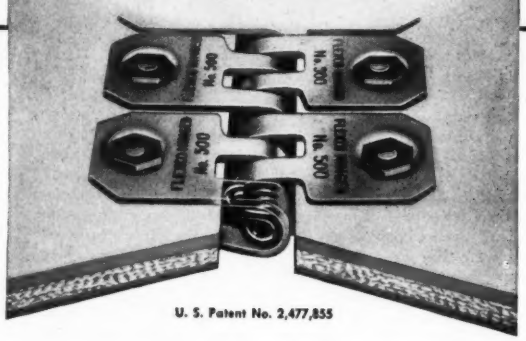

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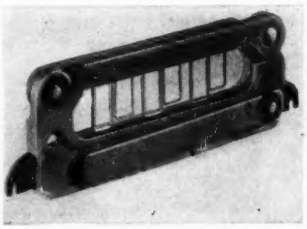
- For joining grader, trencher, ditcher and other earth moving conveyor belts.
- For belts ⅜" to ½" thick.
- A FLEXCO fastener that is HINGED. Has removable hinge pin.
- Troughs naturally, operates through take-up pulleys.
- Strong, durable . . . pull or tension is distributed uniformly across joint.

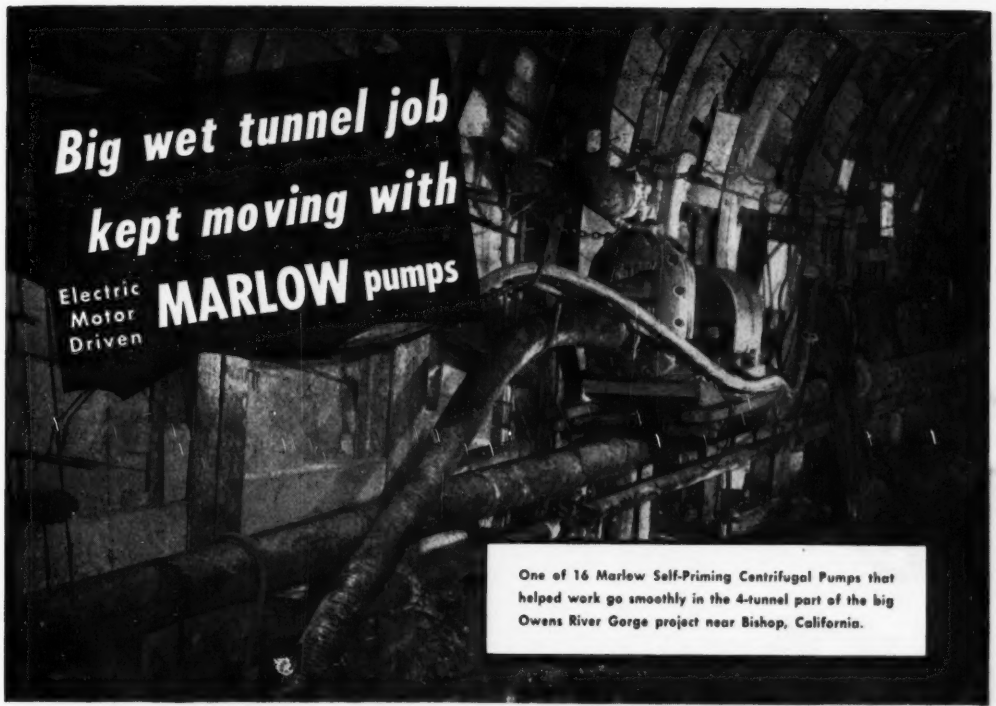
Order From Your Supply House. Ask for Bulletin HF 500.

FLEXIBLE STEEL LACING CO. 4699 Lexington St., Chicago 44, Ill.

CLAMP FOR REINFORCING BARS—An inexpensive clamp which provides an easy, positive union for reinforcing rods utilizes two oval rings as yokes with tapered wedges driven under them in the directions of the stresses. The device actually binds tighter when tension on the rods is increased, and is said to hold rods firmly during pouring or vibrating of concrete. Invented by a retired civil engineer with more than 40 yr experience in road, railway and bridge construction, the clamps have proved useful in attaching rods to dowels in footings and at corners. They also allow use of short rods in tight spots where long lengths can't be used, as well as in box-type basement walls and floor slabs.—**Jerome P. Costello Co., 3527 Bevis Ave., Cincinnati, Ohio.**



TOOL FOR SPARK-PLUG SERVICING—This multi-purpose tool is really four tools in one. It holds stainless steel wire gap gages ranging from .015 to .040 in.; two gap adjusting slots for electrode bending; a double-cut precision file for refacing sparking areas; and four gasket reject slots for determining the utility of used spark plug gaskets. Measuring 3¼x1¼ in., the handy WG-300 gap tool has a molded plastic body. The company says that the U-shape of the wire gages permits easy measurement of electrodes of any type, except four-prong cloverleaf types on aircraft plugs. The gasket reject slots provide a true basis of measurement for determining when a used gasket should be discarded. When a worn-out or overcompressed gasket can pass through the individual slot marked with its size, replacement is indicated.—**Champion Spark Plug Co., Toledo, Ohio.**



One of 16 Marlow Self-Priming Centrifugal Pumps that helped work go smoothly in the 4-tunnel part of the big Owens River Gorge project near Bishop, California.

Courtesy G. M. Philpott Co.

Marlow electric motor driven Self-Priming Centrifugal Pumps — 16 of them — were used by Owens Tunnel Contractors to help keep water out of the way during tunneling on the Owens River Gorge project. The four tunnels varied in length from 1/3 mile to 7 miles . . . long hard digging. Two of the tunnels were very wet but the Marlows took the flood of water in stride. With the water under control, pouring of the 10½ foot diameter concrete tunnel lining moved along on schedule . . . another success to which Marlow pumps contributed heavily.

Electric motor driven Marlow pumps are used more and more by contractors. Where electric power is available, they offer big advantages in automatic operation and lower operating costs. Electric motor or gasoline engine powered — Marlow Self-Priming Centrifugal Pumps have always been able to do more than any other pumps. The astounding new Marlows are *the greatest contractors' pumps ever built*. They prime faster and higher. They handle more water at lower cost. They are non-clogging, maintenance-free and last longer than any others. And the Marlow selection is largest — models in all AGC ratings, 4M through 240M, 1½" to 10" — plus many other models for special use.

— Catalog promptly sent —

A Marlow is the only self-priming centrifugal made with a REPLACEABLE IMPELLER AND DIFFUSER. After long, hard use, they can be easily and inexpensively replaced with new ones to restore the pump to *full original efficiency*. A patented Marlow feature.

MARLOW PUMPS

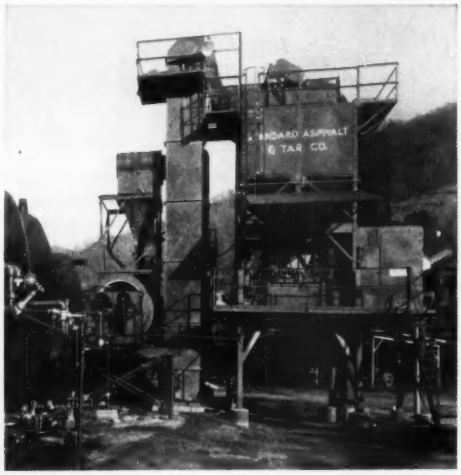
RIDGEWOOD, NEW JERSEY

Manufacturers of the World's Largest Line of Contractors' Pumps Including the Famous Marlow Mud Hogs

TWO TORQUE CONVERTER ITEMS—Fuller Mfg. Co. offers two more additions to the ever-increasing line of torque conversion items. One is a new transmission for use with torque converters, and the other is a new type of torque converter coupling. The transmission—Model 4-FS-1440—was designed for use in the biggest off-highway trucks up to 400 hp. Designed with closely spaced gear ratios and high ratio of capacity to weight, the new transmission makes good load-and-road performance possible in heavy hauling where conditions are unusually severe. The new unit offers the following ratios in five speeds: first, 1.98; second, 1.40; third, 1.00; fourth, .71; reverse, 1.61. The clutch housing size is SAE No. 1 and weight is 775 lb. The 4FS-1440 has two SAE standard large power take-off openings, and may be fitted with speedometer gears. Oil capacity is 14½ qt. The new converter coupling drives are bringing advantages of torque conversion to a variety of construction and materials-handling equipment such as front-end loaders, travel-loaders, tow trucks, cranes, lift trucks and hoists. During starting and pulling under load, the Fuller converter coupling automatically provides up to 2:1 hydraulic torque multiplication, eliminating shock load on all component units of the drive line. During converter operation, the reaction member is locked to the housing through an overrunning clutch—changing the oil direction so that thrust reaction is taken by the housing. As the vehicle's load demand tapers off during normal running conditions, the drive automatically changes to 1:1 coupling operation, providing fuel economy wherever possible, according to the manufacturer. Labelled 12-A, it provides a flanged output and an SAE No. 3 flywheel housing at the rear, permitting installation of a second flywheel automotive clutch with the transmission. Model 12-S has a splined output shaft for straight-line drives with a universal joint. The converter is designed to handle engines developing from 180 to 225 ft-lb of torque at 2,000 to 2,200 rpm, or higher.—**Fuller Mfg. Co., Kalamazoo, Mich.**

H&B ESTABLISHED 1907

PA-20 HOT MIX ASPHALT PLANT



Easily Portable by Truck . . . Efficient on Small as well as Big Jobs

H & B PA type plants are designed especially for the contractor who moves frequently, and who must be able to get efficient production on small as well as large jobs, under a wide variety of operating conditions.

PA plants are particularly adapted for moving by truck and trailer. If desired, the dryer and the mixing-weigh unit can be furnished with tandem axle and fifth wheel. These plants may be driven with individual electric motors or from one main power unit for the tower and one for the dryer. Gasoline, diesel, diesel electric or electric power may be used.

All PA plants are completely assembled and checked before shipment. See your local H & B distributor, or write for Bulletin P-46.

MOTO-PAVER

does the complete mixing and paving job—in one continuous operation. Ideal equipment for resurfacing work. Ask for Bulletin MP-49.

HETHERINGTON & BERNER INC.

Engineers • Manufacturers

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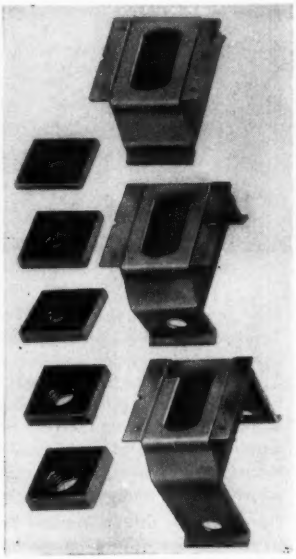

ADJUSTABLE INSERT FOR CONCRETE—A new type of fully adjustable insert for use in concrete eliminates time-consuming "fishing" to get the bolt started in the nut after the nut is placed in an insert. The combination of an elongated hole in the insert face and an off-set hole in the nut makes it possible to put the nut on the bolt before placing it in the insert and then to adjust it to any point of the compass. They are called Super-Grip inserts, and the manufacturer claims that they have other advantages too: they can support 1,500 to 2,400 lb; V-shaped notches in the face and two center grooves on the side simplify alignment of the insert on forms; inserts are of heavy-gage steel and will accommodate bolt sizes from ¼ to ¾ in.—**Super-Grip Anchor Bolt Co., Inc., 3333 N. 22nd St., Philadelphia 40, Pa.**

Keeping a road-razor honed...

UP TO SIX TIMES LONGER!

Grading, the final touch to highway construction . . . or the end of the back-fill on any construction job . . . poses tough problems for 'stay-on-the-job' equipment.

Rocks and low-grade fill lie ready to chew the finest scraper blades . . . unless they are pre-protected with one of the many Airco Hardfacing Alloys available for extending the "sharpedge" life of your equipment *as much as six times longer than ordinary scraper blades.*

But no matter what *your* wear problem, it will pay you to look into the more than twenty Airco Hardfacing Alloys for your tools and parts. Any Airco representative will be glad to give you complete information. Write or call your local Airco Office today.

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PIONEERS are LEADERS

For nearly twenty years the makers of Winslow Filters have been pioneering the idea of giving engines and machinery better protection by keeping ALL your oil clean through the use of *Full-Flow* filtration. These men also hold original patents on the successful application of that principle. You will profit by depending on the leadership of these pioneers.

WINSLOW FILTERS

Winslow Engineering Company • **4069 Hollis St., Oakland 8, Calif.**

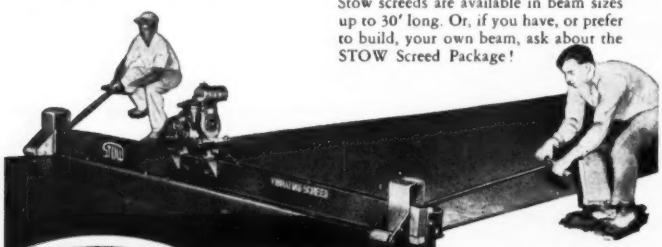
"SAVED $800 PER MILE with my new STOW SCREED!"

Performance like that is *important* on *any* paving job. It's the reason why so many contractors are now using STOW screeds on all their road paving jobs!

STOW vibrating Screeds:

1. Permit placing more than 300 cubic yards in less than 8 hours
2. Strike off and impact in one operation
3. Leave surfaces true to grade
4. Work up to and around manholes and obstructions
5. Have record of proven trouble-free performance *on the job!*

Stow screeds are available in beam sizes up to 30′ long. Or, if you have, or prefer to build, your own beam, ask about the STOW Screed Package!



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STOW MANUFACTURING CO.
31 Shear St. Binghamton, N. Y.

Write today for complete information on Stow Vibrating Screeds and the Stow Concrete Vibrator line. Request Bulletin **526.**

NEW EQUIPMENT BRIEFS

A new line of **temperature and pressure relief valves,** for use on hot water tanks and heaters, has been announced by **McDonnell & Miller, Inc.,** 3500 N. Spaulding Ave., Chicago 18, Ill. Known as the 202 Series, they are available with standard opening pressure settings of 75 lb, 100 lb or 125 lb. Temperature-relieving capacity for all valves, regardless of opening pressure, is 725,000 Btu/hr.

The name "Nite-Hawk" has been applied to a **two-wheel, pneumatic-tired trailer** which carries four 80,000-cp floodlights that can be raised to 8½ ft, and aimed in any direction. Powered by a Winpower 5 kw, 115-v ac generator and a Wisconsin 4-cyl air-cooled engine, the plant has many construction, municipal and airport applications and can serve as a transportable emergency 5,000-w power plant. It's made by **Winpower Mfg. Co.,** Newton, Iowa.

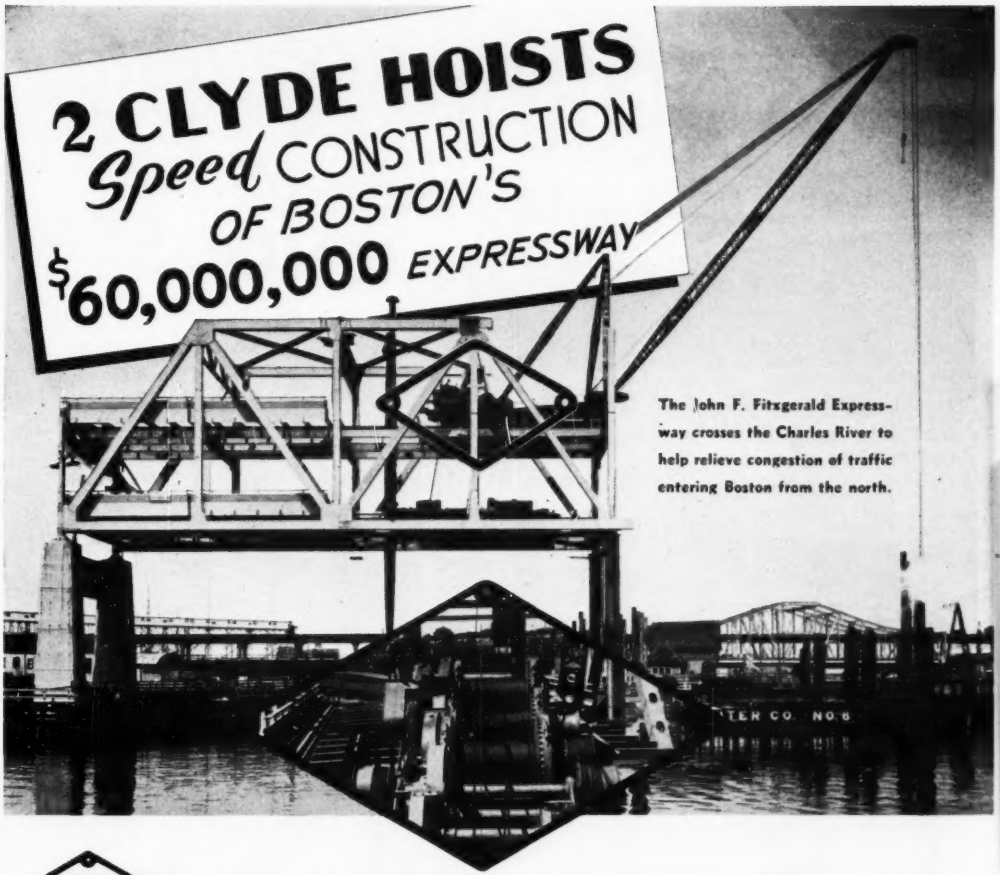
A new special model of the Bostitch T5 **gun-type stapling tacker** has a grooved-nose for installing parallel wires used in installation of telephones and other electrical connections. It fits snugly over the flat wire, holding it against the wood until its handle can be squeezed and a staple driven into the wood, straddling the wires and holding them firmly. It is particularly useful in confined spaces where it might be difficult to swing a hammer, according to the manufacturer **Bostitch,** 897 Mechanic Street, Westerly, R. I.

A new portable **diesel engine pyrometer** has just been announced by **The Bristol Co.,** Waterbury 20, Conn. The thermocouples can be installed in each cylinder and in the main exhaust line so that temperature can be checked at any time by inserting the pyrometer prongs into the corresponding receptacles in the terminal head of the thermocouple. It's labeled Model 4-321.

Sauerman Bros., Inc., 532 S. Clinton St., Chicago 7, have enlarged their line of Durolite **tempered steel sheave blocks** by adding a block designed essentially for slushing, mucking and wrecking duty. Made of heat-treated alloy steel, they have extra wide openings to pass knotted cable.

The Robert Austin Corp., 51 Albany St., Boston 11, Mass., makes an improved "Smoothgrip" **vise jaw** for tubing or plated pipe which it says will not mar, scratch or distort. The vise locks into positive grip simply by depressing the handle. Built-in lugs provide permanent or temporary attachment.

2 CLYDE HOISTS Speed CONSTRUCTION OF BOSTON'S $60,000,000 EXPRESSWAY



The John F. Fitzgerald Expressway crosses the Charles River to help relieve congestion of traffic entering Boston from the north.

CLYDE

Where safe, positive control is important . . . where accurate spotting is demanded . . . where ease of operation and its consequent reduction of accident hazards is imperative . . . where large quantities of materials must be handled fast and economically . . . There You'll Find A Clyde "Quality Plus" Hoist!

Clyde Band Friction Hoists have an exceptionally rigid, all-steel frame that keeps shafts and gears in positive alignment . . . ball and roller bearings throughout to minimize maintenance and more efficiently use the power available . . . smooth, quiet, easily adjusted chain drive running in an oil bath . . . and many other features that attest to the high quality design and craftsmanship of Clyde equipment.

But what is probably most important to the hoist operator is the fatigue-free operation of a Clyde! Internal expanding, band-friction clutches give smooth and positive control of the load with remarkably little effort. The Clyde design makes possible the spotting of more loads per hour with greater ease and safety!

Some of these hoists were used in the construction of the New Jersey Turnpike Bridge and the Delaware River Bridge at Wilmington, Del. Send for circular MP-48, it shows all the advantages of these modern hoists.

WHIRLEYS • DERRICKS • HOISTS • BUILDERS TOWERS • CAR PULLERS • HANDI-CRANES • ROLLERS

CLYDE IRON WORKS, INC.

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DULUTH, MINNESOTA

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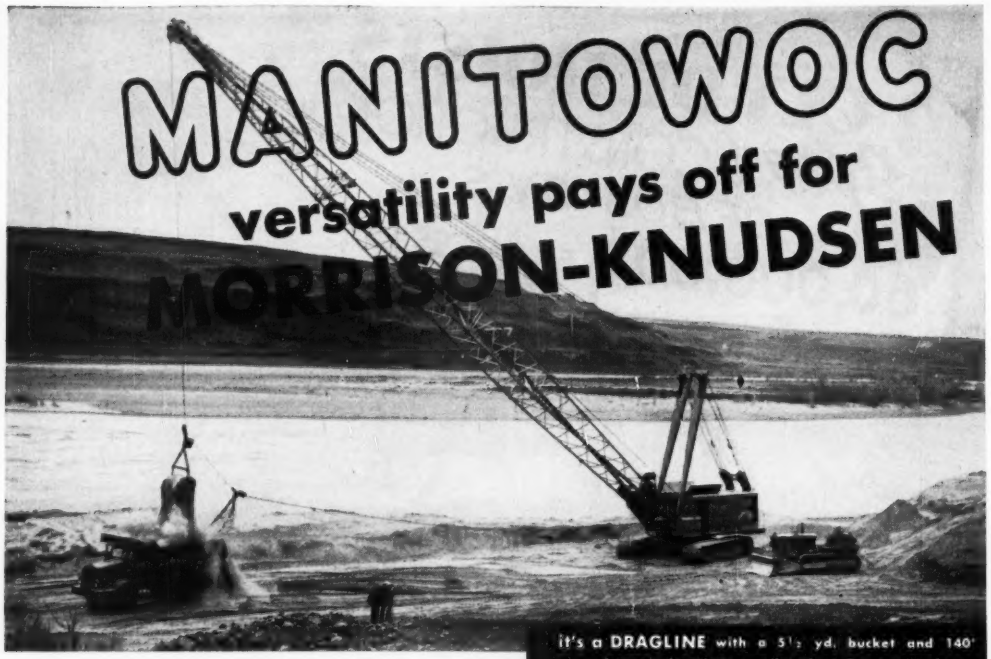
MANITOWOC versatility pays off for MORRISON-KNUDSEN



it's a **DRAGLINE** with a 5½ yd. bucket and 140' boom relocating a railroad at Tomar, Wash.

On the C. J. Strike Dam, Grandview, Idaho, the versatility of the big 5 yd. Manitowoc 4500 is really paying dividends for Morrison-Knudsen Co., Inc.; like it is for other contractors throughout the nation. One of these husky Manitowocs is handling a variety of jobs — alternating from dragline, to crane, to concrete setting as the situations arise—handling each job quickly, efficiently, economically.

Relocating a railroad at Tomar, Washington called for dragline work for a second 4500; then came a quick switch to shovel for the next job and a fast move to Kemmerer, Wyoming.

Not only are these large excavators "quick change" artists, but they can be shifted from location to location almost as fast as the ordinary small shovel. Ships on standard flat cars or trailers — erection time 3-5 days.

A Manitowoc 4500 will cut your costs too, give you small machine mobility and versatility plus big, low cost capacity. Get complete details. Manitowoc Engineering Works, Manitowoc, Wisconsin.

then it's a **SHOVEL** with a 5 yd. dipper and 50' boom transported to Kemmerer, Wyoming.

now it's a **CRANE** along with another Model 4500, erecting steel, turbines and pouring concrete.

MANITOWOC

SHOVELS 1-5 YD. — Speed Crane — CRANES 18-100 TON

New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

ELECTRICAL WIRES AND CABLES—This 186-p, spiral-bound booklet lists in ten chapters every imaginable type of wire and cable made by U. S. Rubber Co. Sections include portable cords and cables, railroad wires and cables, power cables, control and signal cables, building wires and cables, bare and weatherproof wires, flexible cords and cord sets, telephone wires and cables, miscellaneous U. S. wires and cables, and technical data. The book has a host of pictures and numerous tables giving diameters, areas, approximate weights, packaging data, and stranding.—**U. S. Rubber Co., Electrical Wire and Cable Dept., 1230 Ave. of the Americas, New York 20, N. Y.**

SLIP-ON PIPE FITTINGS—Bulletin No. 150 gives many uses, specifications and other data on NU-RAIL slip-on fittings. These are used in the construction of permanent and temporary pipe structures, and are said to save 15% on labor and as much as 30% on over-all costs when compared with conventional threaded pipe and fittings. Made of corrosion-resistant aluminum alloy, there are five basic fittings. Standard pipe comes in sizes from ¾ in. through 2 in. in aluminum, brass, galvanized or black steel, and may be used individually or in combination with NU-RAIL to make practically every conceivable type of fitting. — **The Hollaender Mfg. Co., 3841 Spring Grove Ave., Cincinnati 23, Ohio.**

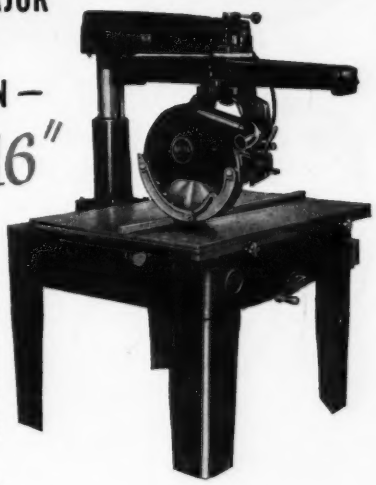
TRACK RAIL WELDER—A 4-p folder describes an automatic "packaged" welder-positioner for rebuilding crawler tracks, fabricating and hard-facing. It explains how an operator can position crawler tracks taken from a tractor, power shovel or trencher and place the entire track chain on a welding bed. After securely clamping it in place, he manually advances the carriage and lowers the head until proper contact is made at the start of the first link. A piece of pressure-sensitive tape is laid across the contact rail at this point and at each succeeding link joint. Flux is poured on to the bed and screeded to the level of the rail. The flux bin on the carriage is filled. Carriage is positioned for the first pass, and welding starts. Each pass after that is automatically controlled. Weld metal is deposited only on the worn portion of each link rail. Grinding or cutting is entirely eliminated so far as welding is concerned, if the setup is properly made.—**Dean Weld Machine, Inc., 10154 Edes Ave., Oakland, Calif.**

RECLAIMING WORN-OUT ROADS—"The Athey Method of Reclaiming Worn-Out Roads" is the title of a 24-p booklet designed to show substantial savings in reclaiming existing road materials in worn-out roads. There are four sections: The first is devoted to photo-diagrams, model views and specification information on the Athey portable breaker and Model 3 force-feed loader; section 2 describes why impact breaking is better and more economical than stationary crushing of rock and blacktop; section 3 shows, step-by-step, the seven sets required in rebuilding blacktop roads. The last section lists factors affecting production of gravel and crushed stone, the gradation of materials, and shows typical graduation achieved with the portable breaker. Other information includes hardness and toughness tables for various types of rock, estimated cost of reclaiming gravel roads, and typical production figures.—**Athey Products Corp., 5631 W. 65th St., Chicago 38, Ill.**

DELTA *Leads Again*

WITH THE FIRST MAJOR IMPROVEMENT IN RADIAL SAW DESIGN —

the DELTA 16" Radial Saw



Completely new, the Delta 16" Radial Saw is the most practical radial saw on the market today, giving you easier and safer performance on every operation you encounter.

Only the Delta gives you a saw blade that stays above the work table on a full 360° arm swing, to cut miters from 0 to 90° right or left, with normal "pull saw" action.

Enclosed "lifetime" trackways are glass-smooth. Hardened surfaces minimize roller friction, carriage travels more easily.

Quick-set stops at 30°, 45°, 60° and 90° speed operation.

Compare These Exclusive Features:

★ **Only Saw With All Controls In Front —safer, easier to operate because every lock, lever, crank and calibrated scale is "up front".**

★ **16" Saw Blade Cuts 5½" Deep—unmatched capacity, more than any other 16" radial saw blade—blade not only cuts deeper but lasts longer.**

★ **One-Piece Aluminum Safety Guard —covers the entire saw spindle for added safety—can be fitted to enclose blade completely.**

★ **Sensational New "Lo-Rise" Motor—powerful direct drive, totally fan-cooled motor furnished in 3, 5 and 7½ HP.**

★ **Front Guide Fence Controls—offer quick, positive locking action when changing guide fence positions; no more hammering of wedges.**

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There's a Delta Power Tool for Your Job

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ADJUSTA-WATE MOTO-MIXERS—Chain Belt Co.'s bulletin No. 52-32 pictorially describes in detail Rex Adjusta-Wate Moto-Mixers. The new mixers carry higher legal payloads. The mixing engine has been taken from its conventional place behind the driver's cab, and placed at the rear of the vehicle above the dual wheels. This allows for a shifting forward of the mixing drum to distribute more of the payload on the front wheels. All features are described, including the flip-flop hopper, chain drum drives, fluid couplings, drum and frame. Four excellent action photos make up the back cover of this booklet which is available from **Chain Belt Co., Construction Machinery Div., 4600 W. Greenfield Ave., Milwaukee 1, Wis.**

TRUCK SELF-LOADER — Brisson Bros. Machinery Co. has available a two-color descriptive folder presenting illustrations of many uses of the "LoDal" that loads, hauls and dumps. Designed for ready reference, the 4-p folder includes specifications and is available from **Brisson Bros. Machinery Co., Norway, Mich.**

'Sizing up" the capacity of a paver or mixer could prove a hazardous shot in the dark. THAT IS—UNLESS IT'S A.G.C. RATED! The A.G.C. Rating Plate is an absolute guarantee that rigid requirements of drum size and mixing capacity have been met. Whether you are a contractor, architect or engineer—the A.G.C. Rating Plate is your protection. Look for it.

Mixer Manufacturers Bureau

Affiliated with the Associated General Contractors of America, Inc.

CHAIN BELT COMPANY Milwaukee, Wis.	THE JAEGER MACHINE CO. Columbus, Ohio	KWIK-MIX COMPANY Port Washington, Wis.
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THE FOOTE CO., INC. Nunda, N. Y.	KOEHRING COMPANY Milwaukee, Wis.	WORTHINGTON PUMP AND MACHINERY CORP. Construction Equip. Div., Dunellen, N. J.

SITE-CAST CONCRETE PIPE — When your project requires large-diameter pipe or is some distance from the nearest pipe supply, you can have a Universal man deliver a complete pipe plant right to the site. He can furnish all equipment and key personnel; local labor can do the work with local material. "You get the pipe you want, when you want it", the booklet says. It goes on to show that by bringing the plant to the job, you save freight charges and time wasted awaiting pipe delivery. Pipe you cast on the site will be in top condition—no loss due to broken ends, cracks or other shipping damage. A series of photos gives the complete Universal site-cast story.—**Universal Concrete Pipe Co., 297 S. High St., Columbus, Ohio**

CHIMNEY FOLDER—Nearly a half-century of Rust's chimney building service to industry is described in a 4-p folder. A pioneer in chimney building and modern chimney maintenance, the Chimney Division has designed and built thousands of radial brick and reinforced concrete chimneys—including many of the world's largest—for every industrial use. Many of these may be viewed in 23 illustrations in the folder which also depicts one of the country's tallest chimneys in various stages of construction.—**Chimney Div., The Rust Engrg. Co., Rust Bldg., Pittsburgh 19, Pa.**

OPEN-GRID BRIDGE FLOORS — How to combat hazardous driving on existing open-grid steel bridge floors is described in a 4-p folder. The solution given is a "Safe-Grip" surfacing machine developed by Reliance Steel Products Co. The machine is leased by Reliance to contractors, state and county engineers, municipal authorities and public road and bridge officials for their use in applying a new non-skid surface to smooth bridge floors. It operates on a 220-v, 3-phase circuit and moves on a track laid on the work surface. — **Reliance Steel Products Co., 3697 Walnut St., McKeesport, Pa.**

VERTICAL WET-PIT CENTRIFUGAL PUMPS—Bulletin 3-8000 covers two similar but functionally different types of vertical, centrifugal, wet-pit pumps; a heavy-duty bilge pump for handling solids-free liquids and drainage and a screenless sewage ejector, constructed to handle sewage and solids-carrying liquids. The bulletin also introduces "Lubri-Vac", a new lubricating system which is said to provide continuous positive lubrication of the pump bearings, reduce bearing failure up to 95%, and increase over-all pump life by 12%. Included in the booklet is a chapter on the company's service to industry.—**Yeomans Brothers Co., 1999 N. Ruby St., Melrose Park, Ill.**

TRENCHDRIL SPEEDS PIPELINE LAYING

The new CP Trenchdril is a highly mobile, complete unit. Suspended from a tractor boom, and mounting two CP-70N Drifters for parallel drilling, it is a tremendous time-saver in ditching for oil and gas transmission lines.

Frame is of steel plate construction . . . exceptionally rigid . . . incorporates built-in receiver with drain plug and separate line oilers with individual shut-off valves . . . tubular cross members mount 4-inch saddles with 7-inch cone for greater stability.

Drill Carriages are identical to those used on the CP heavy-duty G-300 wagon drill . . . tubular construction . . . centralized controls . . . 91" feed travel; longer feeds available.

Drifters are CP-70N's — 4-inch drifters widely used because of their exceptional drilling speed, powerful rotation and hole-cleaning capacity.

Operates from CP Portable Compressor — a rugged unit that will follow a tractor anywhere.

Write for further information.

CHICAGO PNEUMATIC TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

Fiftieth ANNIVERSARY

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These Plain, Hard Facts Prove It...

You save from start to finish with

CHEVROLET ADVANCE-DESIGN TRUCKS

Fact No. 1

THEY LIST FOR LESS

Chevrolet trucks *list for less* than any truck with comparable specifications that can handle an equal payload. Yet your money buys a combination of great truck features that you'll find only with Chevrolet. And that means value unmatched by any other truck in its field.

Fact No. 2

OPERATING COSTS SAVE YOU MONEY

Chevrolet's time-proved Thriftmaster and Loadmaster Valve-in-Head engines are famed for fuel, oil and upkeep economies. Extra-rugged frame, hypoid rear axle, Flexi-Mounted cab, and other features keep the truck rolling for many thousands of low-cost miles.

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With Chevrolet's wide range of models, there's never the problem of "too little" or "too much" truck for the job. Each truck is factory-matched to its job. Standard body on standard chassis, or standard chassis for a special body, there's a Chevrolet truck to cut your costs.

Fact No. 4

YOUR INVESTMENT EARNS A HIGHER RETURN

Big demand for Chevrolet trucks means a traditionally higher price when you trade your Chevrolet for a new one. You save money all the way with a Chevrolet—from the day you buy it until the day you trade it. See your Chevrolet dealer now—and save!

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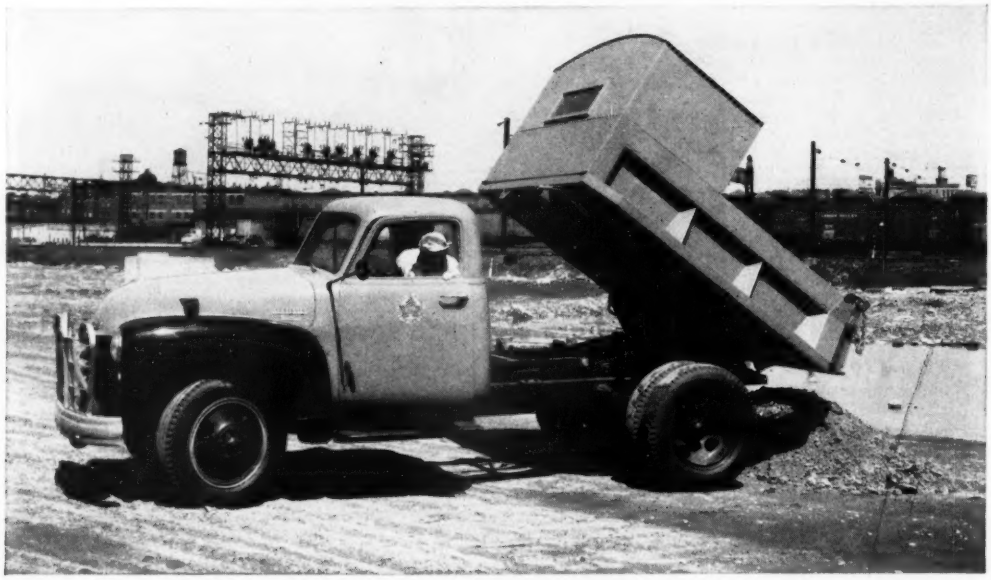

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WELDING ELECTRODE COMPARATOR—This is a compact cardboard device measuring 3x9 in. which tells at a glance the direct comparison between the electrodes manufactured by any one of 20 different manufacturers and those manufactured by the General Electric Co. Any welder, for instance, can set the code for a given manufacturer in the window marked "Code." He can then read a comparison of types between that manufacturer's electrodes and GE electrodes in other windows.—**General Electric Co., Schenectady, N. Y.**

ALUMINUM FORMING — Anyone who works with metal will find a wealth of information on how to draw and form aluminum sheet, plate, tubing and pipe in this 148-p technical manual. It points out that the most common mistake is the attempt to work and form aluminum by the identical technique used for other metals. While similar techniques may be employed in some operations, others require special procedures and this compact illustrated book explains them completely. Two important sections are devoted to metallurgical data—one on aluminum sheet and plate; the other on aluminum tubing and pipe.—**Reynolds Metals Co., 2500 S. Third St., Louisville, Ky.**

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RUBBER FLOORS—Here is a booklet published as part of the new educational program being conducted by the Rubber Flooring Division of the Rubber Manufacturers Assn., Inc., to inform contractors, home owners and others about the advantages of modern rubber flooring. Intended as a non-technical reference book for those who have an interest in building, it contains a brief description of the features of rubber flooring, how it is made, information on installation and recommendations for proper maintenance.—**Rubber Flooring Div., The Rubber Manufacturers Assn., Inc., 444 Madison Ave., New York 22, N. Y.**

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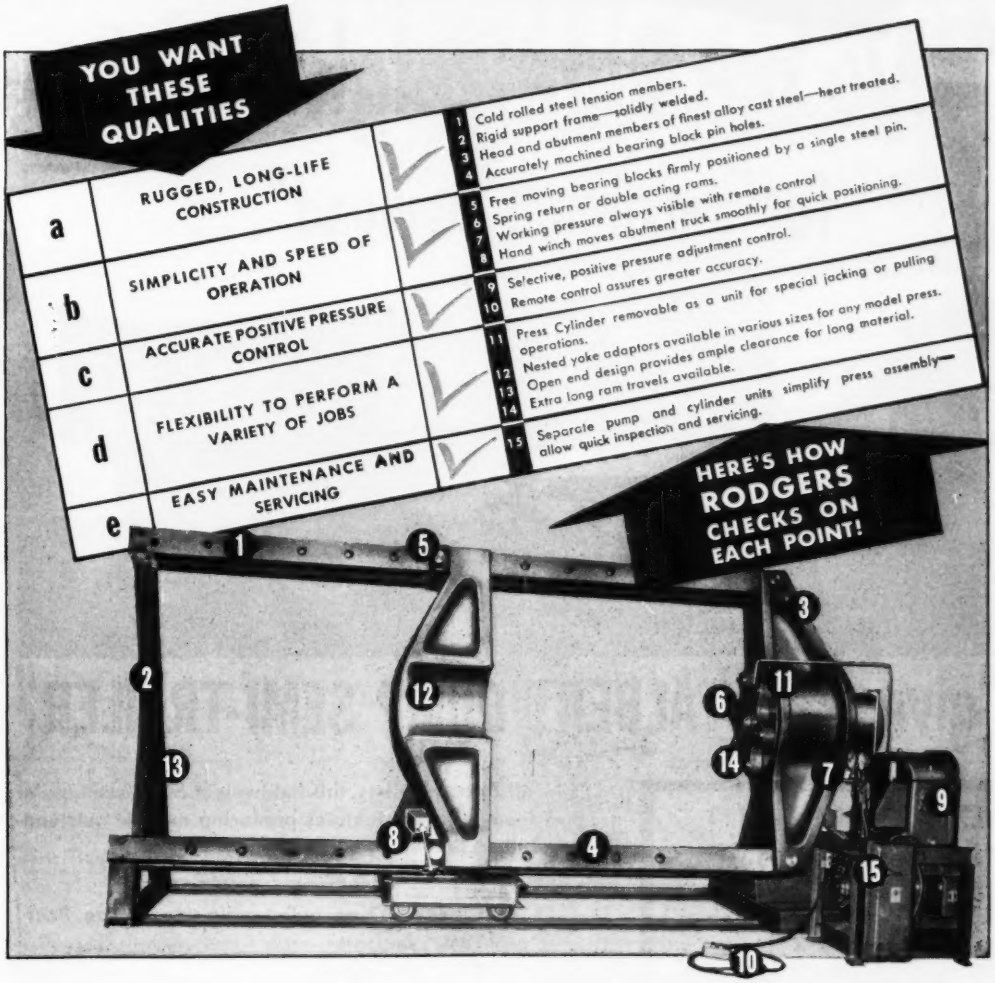
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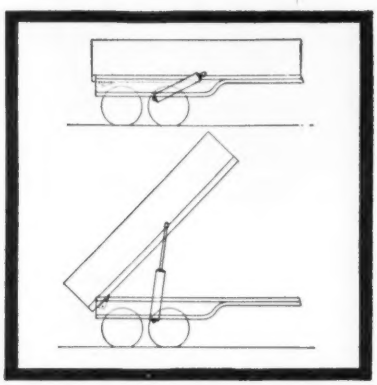

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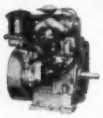

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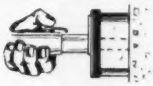
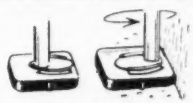
UL ***DRIVE-IT,*** the *first* powder actuated tool approved by Underwriters' Laboratory.	 ***DRIVE-IT*** cannot be discharged accidentally due to the push and turn sequence. This, plus the large safety pad makes *DRIVE-IT* triple safe.	 Exclusive Automatic Barrel Extension for fastenings inside junction boxes or other recesses.
 DRIVE-IT is the only powder-actuated tool which requires but one standard power load regardless of penetration desired.	 Exclusive Swivel Safety Pad easily rotated for getting into close quarter work.	***DRIVE-IT*** "300", lowest cost fastening tool. Low original cost and low operating cost.

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Sworn to and subscribed before me this 9th day of September, 1952.

[SEAL] ELVA G. MASLIN
(My commission expires March 30, 1954)

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CONSTRUCTION
Methods and Equipment

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HOW BOLTED STRUCTURAL JOINTS SPEED UP STEEL CONSTRUCTION

Use of Bethlehem High-Strength Steel Bolts to join structural members helps make steel erection proceed quietly at a smooth, rapid pace. This new method replaces field-driven rivets, with the hexagonal nuts being driven up quickly with power wrenches to form a secure joint. No change in shop work is required as the high-strength bolts do not require a driving fit.

In assembling Bethlehem High-Strength Bolts, a hardened washer is placed under both the head and the nut, to permit development of the high torque required without scoring the connected material. The nuts are driven up on the bolts so tightly that there is no possibility of slip at working loads.

Bethlehem High-Strength Bolts are made of carbon steel, and are heat-treated by quenching and tempering, to conform to the requirements of ASTM Specification A-325. They are manufactured at our Lebanon, Pa., Plant in a range of sizes so wide as to meet virtually every construction requirement.

Send for Helpful Booklet on High-Strength Bolting

We have an interesting 8-page booklet, "High-Strength Bolting for Structural Joints." It's just off the press, and should answer all your questions about high-strength bolting. For your copy, write to us at Bethlehem, Pa.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Bethlehem supplies every type of Fastener

Methods Memo . . .

A TRACTOR-ELEPHANT DUEL ended victoriously for a Caterpillar D8 in the Ceylon jungle. A young bull elephant, enraged when the crawler equipped with a tree dozer approached his herd, charged the big machine. The operator lowered the sturdy dozer and charged right back. Result: One dead elephant.

DESIGN OF CONSTRUCTION EQUIPMENT is forever improving as the natural result of manufacturers, owners and operators all making practical suggestions to increase the application of almost every machine, or article. Other groups hold out the helping hand, too. For example, the James F. Lincoln Arc Welding Foundation anually sponsors several types of design competition, with substantial money awards, in the field of welded design.

One such is the Mechanical Design Award Program, closing July 27, 1953, and which will award a total of $30,000. Among others, there are divisions for construction and mining machinery, pumps, compressors and conveyors. Papers submitted must deal with the use of arc welding in the redesign of an existing machine, previously made otherwise, to employ arc welding in its manufacture or the design of a new machine or component to be fabricated by arc welding. Write to the James F. Lincoln Arc Welding Foundation, Cleveland 17, Ohio.

DEVOTED MEN MAKE NEWS in construction, as elsewhere. The story by Larry Wise, beginning on page 42, on the methods employed to punch access roads into the British Columbia wilderness against terrific odds of winter, snowslides and almost sheer mountainsides, also could be written as an epic tale of raw courage. The dozer operators, scalers and others in pioneering crews persisted doggedly onward to beat work schedules, in spite of repeated setbacks by nature in remote areas never before tackled by machines. It is must reading for red-blooded construction men.

STANDARD GRADES OF LUMBER save time and money on the job, says Frank J. Hanrahan, chief engineer of the National Lumber Manufacturers Association. Ordering of special grades causes delivery delays and higher costs because of extra manufacturing and handling, the possibility of errors and a loss of efficiency when mills must convert from standard items.

Hanrahan led a two-day symposium on wood where he stated, "Modern stress grades and inspection have made lumber a true engineering material . . . The structural and architectural versatility of lumber has been increased greatly by glued laminated lumber which also is available in standardized commercial grades."

LARGEST FARM TRACTOR recently was driven home from the factory by Lawrence Lehman of Wichita, Kan. It is a Euclid 275-hp diesel tractor weighing almost 12 tons and built for large-scale earthmoving work. Lehman plans to use it for custom plowing for wheat farmers, using a six-plow setup that will plow a strip 18 ft wide.

Lehman has accumulated two years of experience by operating a 190-hp Euclid tractor which he bought as war surplus. He estimates that the new unit will double production and lower plowing costs to about 60c an acre. The tractor has 24x25 drive tires, a no-spin differential and 10-speed transmission.

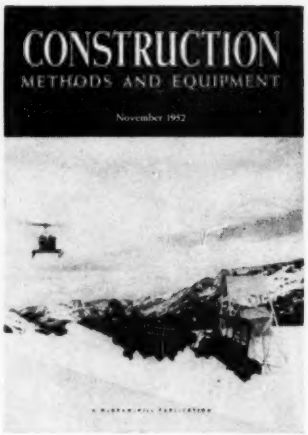
A CRANKSHAFT CAN BE RUINED IN FIVE MINUTES! That's one of the facts Caterpillar Tractor Co. found out in its 7-yr program of research and development along with Purolator Co. in search of a full-flow filter. They took a brand new engine with known crankshaft dimensions of micrometer accuracy, set it up and introduced a big slug of dirt into the oil. They ran it for 5 min, then tore it down to find that the damage had been done in those first few minutes of operation. Result: By the time an operator shops around to find what he thinks is the right filter, the damage is done. Full-flow filters are a fact now, and available on Caterpillar equipment. Look for the entire development story in our December issue.

CONTRACTORS interested in undertaking at a fixed price any of the various types of building and heavy construction projects at the huge atomic energy plant being started in Pike County, Ohio, are asked to prequalify with Peter Kiewit Sons' Co., general contractors for the entire project. Information desired includes:

1. Type of work qualified to undertake
2. Gross volume of business, by years, for past 5 years
3. List of specific work performed
4. Certified bonding capacity and bonding company reference
5. Brief resume of organization and equipment available
6. Bank references
7. Reference to owner and architects or engineers for whom work has been done in last 5 years.

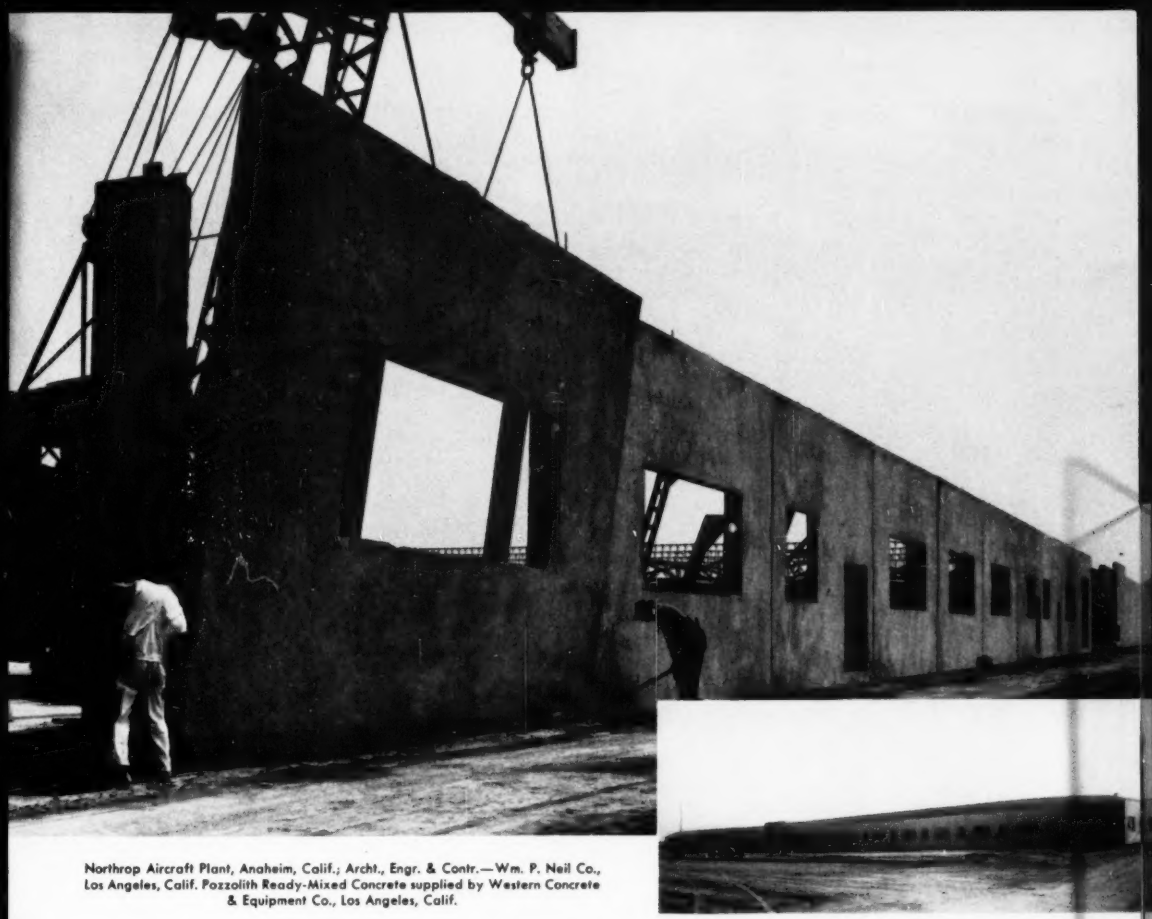
There will also be a large amount of specially fabricated material and equipment to be purchased at a fixed price. Manufacturers and fabricators interested are requested to furnish the same type of information.

Information should be sent to Contract Awards Department, Peter Kiewit Sons' Co., P. O. Box 268, Portsmouth, Ohio.



On the Cover . . .

On top of Kemano-Kildala Pass at El 5,300 in the rugged British Columbia Coast Range, an International TD-24 tractor bulldozes the snow off the site of a transmission tower on the spectacular ALCAN project, as Morrison-Knudsen and Alcan officials arrive for a look-see in a Bell helicopter. As described in the article starting on page 42 of this issue, this is one of several TD-24's that worked their way up the pass over deep snow to clear the tower sites and later, as the snow melted on the lower slopes, bulldozed an access road from the top down. Until the road was completed, just a short time ago, the only access to these high spots was by helicopter. Transportation to the various parts of the project scattered over 5,000 sq mi of this wild terrain is the contractor's biggest problem. (Photo by Elmer Weaver for International Harvester Co.)



Northrop Aircraft Plant, Anaheim, Calif.; Archt., Engr. & Contr.—Wm. P. Neil Co., Los Angeles, Calif. Pozzolith Ready-Mixed Concrete supplied by Western Concrete & Equipment Co., Los Angeles, Calif.

POZZOLITH READY-MIXED CONCRETE .... better, faster, in Tilt-Up Construction

Pozzolith Ready-Mixed Concrete is used extensively in tilt-up construction because it helps builders produce units faster and aids in overcoming shrinkage, crazing and cracking.

In tilt-up construction, as in all types of concrete work, Pozzolith Concrete provides these important advantages:

- EASIER PLACEABILITY — for lower placing costs
- MINIMIZED SEGREGATION — for better appearance
- REDUCED SHRINKAGE — for less cracking
- LOWER PERMEABILITY — for less "waterproofing" expense
- INCREASED BOND-TO-STEEL — for better construction
- GREATER DURABILITY — for longer life concrete

Whatever your concrete requirements, Pozzolith will enable you to obtain them *better and at lower cost* because it reduces the unit water content of the mix.

Write for full information on Pozzolith and the importance of low unit water content.

the MASTER BUILDERS Co.

LEVELAND 3, OHIO — Subsidiary of American-Marietta Company — TORONTO, ONTARIO

It's the NEW Blue Brute 600' portable air compressor

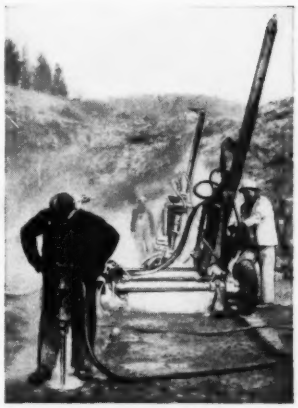
A BIGGER Compressor for your air tools

Here it is . . . biggest and most powerful of all Blue Brute Portable Compressors! This 600' unit *really* costs less to operate, with its *low* fuel consumption and the *minimum* maintenance it calls for.

Just check these Worthington features it incorporates:

Air-operated fuel-saver control that keeps fuel consumption way down (never a pound of unnecessary air pumping, automatic unloading at idling speeds, engine speed in ratio to air requirements) . . . hydraulically controlled clutch for really easy operation . . . identical stack-type, oil-bath air cleaners on engine and compressor for easy servicing . . . two full-length tool boxes with ample capacity . . . two-piece side panels for better temperature control and easy handling by one man . . . unit core radiator and intercooler, offering maximum cooling surface . . . frame protected fuel tank for easy, low level filling . . . three-point engine and compressor mounting . . . formed steel channel frame, semi-elliptical spring mounting and automotive-type steering.

There's even more you'll want to know about this new portable compressor. Write for Bulletin H-850-B74 to Worthington Corporation, Construction Equipment Division, Plainfield, N. J.



ENOUGH AIR IS LEFT OVER in this hookup with the new Blue Brute 600' and with two 4-inch wagon drills to operate the heavy-duty rock drill in foreground!

H.2.4

If It's A Construction Job, It's A *Blue Brute* Job

WORTHINGTON

Construction Equipment